The Consistency Between Treatments Provided to Nursing Facility Residents and Orders on the Physician Orders for Life-Sustaining Treatment Form

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OBJECTIVES: To evaluate the consistency between treatments provided and Physician Orders for Life-Sustaining Treatment (POLST) orders.

DESIGN: Retrospective chart abstraction.

SETTING: Stratified, random sample of 90 nursing facilities in Oregon, Wisconsin, and West Virginia.

PARTICIPANTS: Eight hundred seventy living and deceased nursing facility residents aged 65 and older with a minimum 60-day stay.

MEASUREMENTS: Chart data about POLST form orders and related treatments over a 60-day period were abstracted. Decision rules were created to determine whether the rationale for each treatment was consistent with POLST orders.

RESULTS: Most residents (85.2%) had the same POLST form in place during the review period. A majority of treatments provided to residents with orders for comfort measures only (74.3%) and limited antibiotics (83.3%) were consistent with POLST orders because they were primarily comfort focused rather than life-prolonging, but antibiotics were provided to 32.1% of residents with orders for no antibiotics. Overall consistency rates between treatments and POLST orders were high for resuscitation (98%), medical interventions (91.1%), and antibiotics (92.9%) and modest for feeding tubes (63.6%). In all, POLST orders were consistent with treatments provided 94.0% of the time.

CONCLUSION: With the exception of feeding tubes and antibiotic use in residents with orders for no antibiotics, the use of medical treatments was nearly always consistent with POLST orders to provide or withhold life-sustaining interventions. The POLST program is a useful tool for ensuring that the treatment preferences of nursing facility residents are honored. **J Am Geriatr Soc 2011.**

Key words: ethics; end of life; comfort care; palliative care; nursing facility

A primary goal of advance care planning is to ensure that treatments are consistent with patient preferences near the end of life. Advance directives have been promoted as an important advance care planning tool that enables individuals to record their preferences to guide treatment decisions in the event of incapacitation, but research suggests that advance directives are generally ineffective at ensuring that treatment preferences are honored because of numerous limitations.[1–3] An alternative approach is the use of medical orders such as do not resuscitate (DNR) that communicate preferences in a format that other healthcare professionals can follow. However, such orders typically focus on one type of life-sustaining treatment and do not address the broad range of potential treatments that may be needed.[4,5]

The Physician Orders for Life-Sustaining Treatment (POLST) program is designed to help ensure that patients' preferences for a range of treatments are honored by documenting preferences in the form of standardized medical orders that transfer with them throughout the healthcare system. The POLST program is primarily intended for patients whose death in the next 12 months would not be a surprise. The centerpiece of the program is a medical order form that contains orders to address four categories of treatment: Section A–cardiopulmonary resuscitation (CPR); Section B–medical interventions; Section C–antibiotics; and Section D–artificial nutrition. The POLST program was initially developed in Oregon in the early 1990s, but its use has spread to include a number of states, including Wisconsin

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(since 1997) and West Virginia (since 2001, in which it is referred to as a Physician Orders for Scope of Treatment (POST) program and form). For a complete list of states and sample POLST forms, see www.polst.org.

Previous research on the POLST program has explored whether POLST orders are consistent with the treatments provided. In an early study of eight Oregon nursing homes, 180 residents with orders for DNR (Section A) and Comfort Care Only (Section B) were followed prospectively for 1 year. None of the residents received CPR, intensive care unit (ICU) care, or ventilator support contrary to their POLST orders, and a majority of hospitalizations occurred with the explicit goal of enhancing comfort, suggesting high rates of consistency with POLST Section B orders.[6] In contrast, a retrospective study published in 2000 examined the care provided in the last 2 weeks of life to 54 frail older adults in Oregon who had died.[7] The study found that only 39% (21/54) had all their POLST instructions followed, although the rate of consistency varied according to POLST form section. A more recent hospice study found high rates of consistency between treatments and orders.[8] It is unclear whether the findings from these small convenience samples are generalizable to other populations or to nursing facility residents in other parts of the country. It is possible that POLST form modifications made over the past decade to enhance and clarify the orders in each section may have improved the rates of consistency since prior studies.

Data from a federally funded multistate study were analyzed to assess the rate of consistency between POLST orders and treatments provided to nursing facility residents.

METHODS

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

Participants

The sample was obtained from a random, stratified sample of 90 nursing facilities (30 per state) in Oregon, Wisconsin, and West Virginia. The facilities were stratified based on location (urban/rural), profit status (for profit/nonprofit), and minority representation (with oversampling of facilities with higher rates of minority residents based on Minimum Data Set (MDS) data obtained from the Centers for Medicare and Medicaid Services (CMS)). Participants consisted of living and deceased nursing facility residents with valid POLST forms aged 65 and older with an original admission date at least 60 days before the date of data collection. The time frame of 60 days was used to allow for sufficient time to capture relevant treatments and exclude residents receiving short-term rehabilitation. For a POLST form to be valid, it must contain the resident's name, resuscitation orders (Section A), and the signature of an authorized clinician.

Procedures

Research assistants traveled to participating nursing facilities in Oregon, Wisconsin, and West Virginia to conduct chart reviews between June 2006 and April 2007. Twenty medical charts were randomly selected at each facility with a goal of 10 living and 10 deceased residents. Randomization consisted of a two-step process. First, the charts of minority residents were oversampled using a predetermined sampling target developed by a statistician using CMS facility-specific data. Once the charts for living and deceased minority residents were located, these were subtracted from the goal of 10 living and 10 deceased charts to determine the number of remaining charts needed for each group. Second, a list of eligible living and eligible deceased residents was obtained from nursing facility personnel in whatever format was readily available, and the total number of residents on each list was divided by the target sample number (total number residents/sample target = n). The research assistants then pulled every n^{th} chart on the list of eligible living and deceased residents for review. 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. Interrater reliability, assessed throughout data collection, was high (kappas = 0.91–1.00). The study methodology has been discussed in detail previously.[4]

Data Collection

Demographic data extracted from the chart included age, sex, race, hospice enrollment, cognitive functioning, and length of stay. POLST orders and data reflecting the use of life-sustaining treatments addressed by the POLST form were recorded, including CPR (Section A); hospitalization and emergency department (ED) visits, ICU care, intubation and ventilator support, intravenous (IV) fluids, dialysis, transfusion, surgery and invasive diagnostic tests, chemotherapy, and radiation (Section B); antibiotics (Section C); and feeding tubes (Section D).

A computerized data collection tool was developed in Microsoft Access (Microsoft, Corp., Redmond, WA) to facilitate systematic data abstraction across sites. An automated decision tree was integrated into the data collection tool to identify when a treatment provided was discrepant or potentially discrepant from the documented POLST order. For example, when a hospitalization was recorded for a resident with "comfort measures only" orders in Section B, the research assistants were directed to review the chart for additional data regarding the rationale for the hospitalization. The identification of discrepancies was primarily limited to the identification of overtreatment because charts typically lacked sufficient information to determine whether a treatment was warranted but not provided. Resuscitation was the only exception, because it was possible to determine whether resuscitation was provided to deceased residents with "full code" orders.

Assessing Consistency of Treatments Provided with Orders

When treatments were provided despite the presence of an order specifying no treatment or treatment under specific circumstances only, additional information was obtained from the research assistants' notes about the rationale for the discrepancy. For residents with more than one

inconsistency for a section, the first event was used in the analysis. Each case was reviewed on an individual basis and coded if the notes indicated that the treatment was provided because the resident or surrogate changed their mind, if there was insufficient information to determine the rationale for the treatment for orders that permit treatments in some situations, or the treatment appeared potentially discrepant. Specifically, Section B (medical interventions) and Section C (antibiotics) contain order options that direct use of these treatments when needed to enhance comfort. The investigators discussed a list of potentially discrepant treatments provided to residents with these orders and the rationale for each treatment until consensus was reached about whether the provided treatments offered benefits that were primarily comfort enhancing (consistent with orders) or primarily life prolonging (inconsistent with orders). Decisions were based on the literature, existing POLST educational materials (see www.POLST.org), and experience with the POLST program. This led to the development of the treatment decision rules. Treatments provided with the explicit, documented goal of reducing pain or suffering were always considered comfort care; treatments provided for non-life-threatening conditions with a primary benefit of enhancing comfort were always considered comfort care; and treatments provided for life-threatening conditions with no expected enhancement of comfort were considered primarily life prolonging. Feeding tubes provided to residents with Section D orders for a "defined trial period" of feeding tube use but with no identified end point or use for longer than 30 days were considered primarily life prolonging and were counted as inconsistent with the order for a defined trial period.

Data Analysis

Descriptive statistics were computed using SPSS 16.0 (SPSS, Inc., Chicago, IL). The chi-square test was used to test for significant differences between groups. Narrative data about the rationale for each apparently inconsistent treatment were reviewed to determine whether the treatment's primary benefit was to enhance comfort or prolong life using the treatment decision rules described above. Analysis focused on the treatments provided and whether these were consistent or inconsistent with POLST form orders.

RESULTS

Sample

Data were obtained from facilities that were largely urban (60%) and for profit (67%), with an average size of 101 beds (range: 41–473). The sample consisted of chart data for 870 residents with valid signed and dated POLST forms. A majority of residents were female (69%), white (88%), and living at the time of the chart review (57%) and had a mean age of 84.1 (range: 65–109). The average length of stay was 3.1 years (range: 62 days to 29.1 years), and 14.3% were enrolled in hospice at the time of the study. Their mean level of cognitive function was 4.9 on the MDS Cognition Scale (range: 0 (cognitively intact) to 10 (very severe impairment)).[9]

Changes in POLST Orders

A majority of residents with POLST forms (85.2%, 741/870) had the same POLST in place during the entire 60-day review period. In a minority of cases, the POLST form was newly written during the review period (9.7%, 84/870), or POLST form orders were changed during the review period (5.2%, 45/870). New or revised POLST forms were more common for deceased residents (24.1%, 99/410) than for living residents (6.5%, 30/460; $P < .001$) and were more common for hospice enrollees (26.6%, 33/124) than for those not enrolled in hospice (12.9%, 96/746; $P < .001$). There were no differences between those with new or revised forms and those with the same form in age, sex, or race (older residents, $P = .86$; women, $P = .16$; whites, $P = .86$). Forms with revisions typically reflected a change to orders for less-aggressive treatment (80%, 36/45), rather than a change to more-aggressive treatment (17.7%, 8/45) or a mix of more- and less-aggressive treatments (2.2%, 1/45). Residents with POLST forms in effect for less than 60 days or whose POLST forms were revised within 60 days before the review date were excluded from subsequent analyses, leaving a final sample of 741 residents. Table 1 contains information about the types of orders documented on the POLST form for living and deceased residents. Deceased residents were more likely to have orders limiting resuscitation, medical interventions, antibiotics, and feeding tubes than living residents.

Consistency Between Resuscitation and POLST Section A Orders

There were no instances of successful resuscitations in this sample. Of 299 deceased residents with a "DNR" order, none received unwanted CPR, meaning that 100% of these residents received treatment consistent with their orders. Resuscitation was attempted for 8.3% (1/12) of deceased residents with "full code" orders, suggesting that treatment was potentially inconsistent in 92% (11/12) of cases, although in 42% (5/12) of the cases in which "full code" was ordered, a more-recent "DNR" order superseded the POLST order for resuscitation. Resuscitation was not attempted in a majority (86%, 6/7) of the residents with valid "full code" orders. The provision or withholding of CPR was consistent with Section A orders regarding resuscitation for 98.0% (300/306) of residents (Table 2).

Consistency Between Medical Interventions and POLST Section B Orders

A minority of residents with orders for "comfort care only" (13.7%, 41/300) received one or more treatments during the 60-day review period that initially appeared to be inconsistent with orders to limit medical interventions. The treatment decision rules were applied to determine whether the rationale for the treatment was primarily comfort focused or life prolonging. Cases in which the order was revoked (n = 2) or there was insufficient information to make a judgment about the rationale for the treatment (n = 4) were dropped from the denominator. It was determined that 74.3% (26/35) of treatments provided to residents with orders for "comfort care only" were consistent

Table 1. Comparison of Orders for Living and Deceased Residents with the Same Physician Orders for Life-Sustaining Treatment (POLST) Form in Place for 60 Days or Longer

POLST Section	POLST Order	Living Residents (n = 430)	Deceased Residents (n = 311)	All Residents (n = 741)
		n/N (%)		
A: Resuscitation* (n = 741)	Do not resuscitate (n = 635)	336/430 (78.1)	299/311 (96.1)	635/741 (85.7)
	Full code (n = 106)	94/430 (21.9)	12/311 (3.9)	106/741 (14.3)
B: Medical interventions* (n = 718)	Comfort care only (n = 300)	140/419 (33.4)	160/299 (53.5)	300/718 (41.8)
	Limited additional interventions (n = 335)	208/419 (49.6)	127/299 (42.5)	335/718 (46.7)
	Full treatment (n = 83)	71/419 (16.9)	12/299 (4.0)	83/718 (11.6)
C: Antibiotics† (n = 709)	No antibiotics (n = 28)	11/413 (2.7)	17/296 (5.7)	28/709 (3.9)
	Limited antibiotics (n = 227)	122/413 (29.5)	105/296 (35.5)	227/709 (32.0)
	Antibiotics (n = 454)	280/413 (67.8)	174/296 (58.8)	454/709 (64.0)
D: Feeding tube* (n = 678)	No feeding tube (n = 417)	224/393 (57.0)	193/285 (67.7)	417/678 (61.5)
	Defined trial period (n = 193)	117/393 (29.8)	76/285 (26.7)	193/678 (28.5)
	Long-term (n = 68)	52/393 (13.2)	16/285 (5.6)	68/678 (10.0)

Group differences in orders for section significant at $^{*}P \leq .001$, $^{\dagger}P < .05$.

with the goal of enhancing comfort. Of residents with orders for "limited additional interventions," 18.8% (63/335) received potentially inconsistent treatment. The order was revoked in one case, and there was insufficient information to make a determination about the rationale for treatment in four cases, so these cases were dropped from the denominator. After the application of the treatment decision rules, it was determined 98.3% (57/58) of treatments provided were consistent with the "limited additional" interventions order, because the rationale for the treatment was primarily comfort focused or because it was otherwise consistent with the order to provide medical interventions as written. For Section B, the consistency rate between treatments provided and orders about medical interventions was 91.1% (102/112) (Table 2). Table 3 provides information about the classification of treatment rationales as primarily comfort focused or life prolonging and whether these rationales were determined to be consistent with Section B orders.

Consistency Between Antibiotics and POLST Section C Orders

Of the 28 residents with orders for "no antibiotics", nine (32.1%) received an antibiotic inconsistent with POLST orders. In two cases, a family member revoked the POLST order. None of the seven rationales for the remaining uses of antibiotics were consistent with the orders for "no antibiotics". Sixty-five of 214 (30.4%) residents with orders for "limited antibiotics" (e.g., antibiotics for comfort purposes only) received antibiotics. The order for "limited antibiotics" was revoked in one case, and there was insufficient information to judge the rationale in four cases. Based on the treatment decision rules, it was determined that these treatments were consistent with orders for "limited antibiotics" in 83.3% (50/60) of cases. The consistency rate between antibiotics use and Section C orders was 92.9% (224/241) (Table 2). Table 3 provides information about the classification of antibiotic use as primarily comfort focused or life prolonging and whether these rationales were determined to be consistent with Section C orders.

Consistency Between Feeding Tube Use and POLST Section D Orders

A small minority (1%, 4/417) of residents with orders for "no feeding tubes" had a feeding tube in place during the review period. When the treatment decision rules were applied, it was determined that only one of these uses was consistent with the POLST order to limit artificial nutrition by tube because of special additional instructions. It was indicated that the resident already had a feeding tube and that the no feeding tube order was written to instruct that the tube should not be reinserted if it came out. Although the POLST form allows orders for a "defined trial period of feeding tubes," the five residents with these orders who had feeding tubes all had feeding tubes in place for longer than 30 days, and four of these five residents died with the feeding tube in place. The consistency rate between feeding tube use and Section D orders was 63.6% (14/22). See Table 2 for more information.

Consistency Between All Treatments Provided and POLST Orders

Overall, 94.0% (640/681) of treatments provided were consistent with POLST orders.

DISCUSSION

Findings from this study suggest that the treatments provided to nursing facility residents with POLST orders are largely consistent with POLST orders for resuscitation (98%), medical interventions including hospitalization (91.1%), and antibiotics (92.9%) and modestly consistent with orders for feeding tube use (63.6%) yet allow for the use of appropriate treatment to enhance comfort when necessary. Achieving a match between patient goals and treatments has been described as the criterion standard for palliative care,[10] and the data from this study suggest that POLST succeeds in ensuring that patient preferences match the treatments provided 94.0% of the time. It may be that the process of completing a POLST form in advance helps

Table 2. Consistency Between Physician Orders for Life-Sustaining Treatment (POLST) Form Orders and Relevant Treatments Provided to Nursing Facility Residents

POLST Section	POLST Orders		Receiving Relevant Treatments	Not Receiving Relevant Treatments	Order Revoked*	Insufficient Information†	Provided Treatments Consistent with Order	Provided Treatments Inconsistent with Order	Provided Treatments Consistent with Order by Section
A: CPR	DNR (n = 635)	Living (n = 336)	0/336	336/336	0	NA	NA	NA	300/306 (98.0%)
		Deceased (n = 299)	0/299	299/299‡	0	NA	299/299‡	0/0	
	Full code (n = 106)	Living (n = 94)	0/94	94/94	0	NA	NA	NA	
		Deceased (n = 12)	1/12	11/12	5§	NA	1/7	6/7	
B: Medical interventions	Comfort care only (n = 300)		41/300	259/300	2	4	26/35	9/35	102/112 (91.1%)
	Limited additional interventions (n = 335)		63/335	272/335	1	4	57/58	1/58	
	Full treatment interventions (n = 83)		19/83	64/83	0	NA	19/19	0/19	
C: Antibiotics	No antibiotics (n = 28)		9/28	19/28	2	NA	0/7	7/7	224/241 (92.9%)
	Limited Antibiotics‖ (n = 214)		65/214	149/214	1	4	50/60	10/60	
	Full treatment antibiotics (n = 467)		174/467	293/467	0	NA	174/174	0/174	
D: Artificial nutrition	No feeding tubes (n = 417)		4/417	413/417	0	0	1/4#	3/4	14/22 (63.6%)
	Defined trial period (n = 193)		5/193	188/193	0	0	0/5	5/5	
	Long-term (n = 68)		13/68	55/68	0	NA	13/13	0/13	

Completion of POLST sections B, C, and D is optional, so sample sizes vary according to POLST section. Relevant treatments for each specific order are as follows: Cardiopulmonary resuscitation (CPR) (Section A); hospitalization and emergency department visits, intensive care unit care, intubation and ventilator support, intravenous fluids, dialysis, transfusion, surgery and invasive diagnostic tests, chemotherapy, and radiation (Section B); antibiotics (Section C); and feeding tubes (Section D).

* When evidence was found that the POLST order was revoked, the case was removed from the denominator in the calculation of consistency and inconsistency.

† Treatments provided to residents with orders permitting treatment in some circumstances but insufficient information to determine the treatment rationale were removed from the denominator.

‡ The absence of CPR is consistent with a do-not-resuscitate (DNR) order for deceased residents. It was counted as a provided treatment consistent with the orders because the treatment was indicated but not provided.

§ In all five cases, a non-POLST DNR order was written before death, but the POLST was not revised accordingly, so these were counted as revocations.

‖ Section C orders for limited antibiotics include exceptions allowing for treatments to enhance comfort on the current Wisconsin POLST form and prior versions of the Oregon POLST form.

In one case, treatment was being provided when the POLST order was written. The order specifically stated: "No feeding tube in the future. Has feeding tube; if feeding tube fails, do not reinsert."

NA = not applicable.

Table 3. Categorization of Treatment Rationales as Primarily Comfort Focused or Potentially Life Prolonging According to Treatment Order*

POLST Section	Treatment	Rationale	Primarily Comfort Enhancing	Primarily Life Prolonging	Consistent with Order?	Overall Consistency Between Treatment Provided and Order, N/N (%)
B: Comfort care only (n = 300)	ED/Hospitalization	Trauma related to fall	13	–	Yes	26/35 (74.3)
	ED/Hospitalization	Uncontrolled pain or pain evaluation	4	–	Yes	
	ED/Hospitalization	Gastrointestinal bleeding	3	–	Yes	
	ED/Hospitalization	Significant bleeding	2	–	Yes	
	ED/Hospitalization	Chronic heart failure or pulmonary edema	2	–	Yes	
	ED/Hospitalization	Gastrointestinal bowel obstruction	1	–	Yes	
	ED/Hospitalization	Wound infection and care	1	–	Yes	
	ED/Hospitalization	Upper respiratory infection	–	4	No	
	ED/Hospitalization	Pneumonia	–	2	No	
	ED/Hospitalization	Altered level of consciousness	–	1	No	
	ED/Hospitalization	Cerebrovascular accident	–	1	No	
	Intravenous fluids	Electrolyte imbalance	–	1	No	
B: Limited additional interventions† (n = 300)	ED/Hospitalization	Pneumonia	–	8	Yes	57/58 (98.3)
	ED/Hospitalization	Trauma related to fall	8	–	Yes	
	ED/Hospitalization	Altered level of consciousness	–	7	Yes	
	Intravenous fluids	Dehydration	–	6	Yes	
	ED/Hospitalization	Uncontrolled pain or pain evaluation	5	–	Yes	
	ED/Hospitalization	Upper respiratory infection	–	5	Yes	
	ED/Hospitalization	Significant bleeding	4	–	Yes	
	ED/Hospitalization	Chronic heart failure or pulmonary edema	3	–	Yes	
	ED/Hospitalization	Hypoglycemia	–	2	Yes	
	ED/Hospitalization	Amputation of foot or leg	–	1	Yes	
	ED/Hospitalization	Wound infection and care	1	–	Yes	
	ED/Hospitalization	Gastrointestinal bleeding	1	–	Yes	
	ED/Hospitalization	Gastrointestinal bowel obstruction	1	–	Yes	
	ED/Hospitalization	Renal calculi	1	–	Yes	
	Dialysis	Renal failure	–	1	Yes	
	Intravenous fluids	Medication administration	–	1	Yes	
	ED/Hospitalization	Hypertension	–	1	Yes	
	ED/Hospitalization	Cerebrovascular accident	–	1	Yes	
	ICU Admission	Pneumonia	–	1	No	
C: No antibiotics (n = 28)	Antibiotics	Urinary tract infection	4	–	No	0/7 (0)
	Antibiotics	Upper respiratory infection	–	1	No	
	Antibiotics	Skin or wound infection	1	–	No	
	Antibiotics	No reason provided	–	–	No	
C: Limited antibiotics‡ (n = 227)	Antibiotics	Urinary tract infection ($n = 1$)	39	–	Yes	50/60 (83.3)
	Antibiotics	Skin or wound infection	7	–	Yes	
	Antibiotics	Eye infection	1	–	Yes	

(Continued)

Table 3. (Contd.)

POLST Section	Treatment	Rationale	Primarily Comfort Enhancing	Primarily Life Prolonging	Consistent with Order?	Overall Consistency Between Treatment Provided and Order, N/N (%)
	Antibiotics	*Clostridium-difficile* infection	1	–	Yes	
	Antibiotics	Stomach ulcers	1	–	Yes	
	Antibiotics	Oral infection	1	–	Yes	
	Antibiotics	Pneumonia	–	7	No	
	Antibiotics	Upper respiratory infection	–	3	No	

* Categorization of treatment rationales as primarily comfort focused or primarily life prolonging was determined using treatment decision rules developed by the research team.
† Section B orders for limited additional interventions allows for treatments to enhance comfort and to prolong life within certain limitations.
‡ Section C orders for limited antibiotics include exceptions allowing for the use of antibiotics to enhance comfort only.
ED/Hospitalization = emergency department visit with or without hospitalization; ICU = intensive care unit.

account for the high degree of consistency between treatments and preferences, as has been found in other research.[11]

There is no consensus among healthcare professionals about what constitutes comfort measures, and few articles have been published on this subject. A recently proposed comfort measures protocol is a helpful starting point but is focused on the last hours or days of life. It does not address the use of comfort measures in the last weeks or months of life, which may involve decisions about a range of treatments such as antibiotics and feeding tubes.[12] The lack of consensus in the literature led the research team to develop the treatment decision rules to make determinations about the primary likely benefit of treatments. For example, although pneumonia can cause substantial discomfort in residents with dementia if symptomatic treatment is not provided,[13] research suggests that the use of antibiotics does not necessarily decrease discomfort and may even increase it.[14] Therefore, the use of antibiotics for pneumonia was categorized as primarily life prolonging. Overall, the rationale for 74.3% of the medical interventions provided to residents with comfort care only and 83.3% of the antibiotics used for residents with orders for limited antibiotics were determined to be primarily comfort enhancing rather than life prolonging using the treatment decision rules. This suggests that more-extensive interventions may be necessary to enhance comfort in some situations[15] and raises questions about the use of do-not-hospitalize orders in some nursing facilities. Although inappropriate hospital transfers are a serious concern in the nursing facility population,[16] the use of do-not-hospitalize orders may result in fewer hospitalizations[17] without clearly addressing the need for transfers in situations in which comfort needs cannot be met, such as a hip fracture or uncontrolled pain.[18] Similarly, the presence of no-antibiotic orders on some versions of the POLST form may be problematic because it does not allow exceptions for comfort needs. A majority (5/7) of the residents who received antibiotics despite the presence of no-antibiotics orders were treated for what were otherwise considered primarily comfort-enhancing rationale (e.g., skin infection and urinary tract infections).

A majority (96.1%) of deceased residents had DNR orders reflecting preferences to withhold resuscitation in the event of cardiac arrest, and this wish was honored in 100% of cases, but resuscitation was not attempted for six of seven residents with valid full code orders at the time of death. There are a variety of reasons that resuscitation may not have been attempted in this sample of nursing facility residents, including the possibility of facility practices to withhold CPR in unwitnessed arrests because it is so rarely successful.[19] Study findings are also consistent with a research review of 11,976 nursing home deaths in 126 nursing homes that found that CPR was attempted in fewer than 3% of deaths. In half of the facilities, CPR was never attempted, which led the authors to conclude that CPR is rarely performed in nursing facilities, regardless of orders or policy.[20]

This study has several limitations. First, it focused narrowly on the consistency between POLST orders and treatments provided during a brief period of time. (60 days) Treatments indicated but not provided and decisions

to withhold treatments in accordance with POLST orders (other than resuscitation) could not be reliably captured using chart review methods. Second, in a previously published analysis of data from this same sample, residents with POLST forms indicating preferences for comfort care only in Section B were significantly less likely to be hospitalized or receive other medical interventions than residents with orders for full treatment,[4] suggesting that the estimates of consistency between treatments provided and orders may underestimate the overall effect of the POLST form on treatment decisions. Because of the study methodology, it was difficult to detect undertreatment in the nursing facility or overtreatment for nursing facility residents transferred to the hospital setting because it was not possible to access data about residents who were transferred to the hospital but did not return. This may have also skewed the number of deceased residents with DNR orders in this sample. Fourth, residents with changes in their POLST forms in the last 60 days were excluded from the sample, and it is possible there are more discrepancies between orders and treatments in unstable or rapidly changing situations. Fifth, because there were few inconsistencies, there was insufficient power to explore the relationship between resident or facility characteristics and treatment discrepancies. Finally, determinations about whether treatments are primarily comfort enhancing or life prolonging are not well established in the medical literature for a number of treatments. It is likely that there will be differences of opinions about the use of treatment decision rules and the categorization of treatment rationales outlined in Table 3. Differences in judgment about when a treatment is indicated for comfort may account for some of the inconsistencies identified in this sample. It is hoped that this study will stimulate discussion and debate about the primary benefits of treatment for various conditions and the use of some interventions to enhance comfort. Further research is needed to better understand the effect of frequently used treatments on comfort.

Study findings indicate that, with a few exceptions, POLST form orders are largely consistent with the treatments provided yet are flexible enough to ensure the use of comfort-enhancing interventions when needed. The use of the POLST program represents a useful strategy for ensuring that treatment preferences are honored in the long-term care setting.

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Conflict of Interest: SH is the Vice Chair of the Indiana Patient Preferences Coalition, which is working to create an Indiana version of the POLST Program. AM is Director of the West Virginia Center for End-of-Life Care, which runs the West Virginia POLST Program. BH oversees the Wisconsin POLST Program. ST is a member of the Oregon POLST Task Force. SH is a consultant to the National POLST Paradigm Task Force. AM, ST, and BH are all Board Members on the National POLST Paradigm Task Force.

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Author Contributions: Dr. Hickman had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of data analysis. Hickman, Perrin, Tolle: Study concept and design. Perrin, Nelson, Hickman: Statistical analysis. Hickman, Nelson, Moss, Tolle, Perrin, Hammes: Data interpretation. Hickman: Drafting of manuscript. Hickman, Nelson, Moss, Tolle, Perrin, Hammes: Critical revisions of manuscript for intellectual content. Hickman, Nelson, Moss, Hammes: Data acquisition and study supervision.

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