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Care Preferences in Physician Orders for Life Sustaining Treatment in California Nursing Homes

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Abstract

Background: Physician Orders for Life-Sustaining Treatment (POLST) facilitates documentation and transition of patients' life-sustaining treatment orders across care settings. Little is known about patient and facility factors related to care preferences within POLST across a large, diverse nursing home population. We describe the orders within POLST among all nursing home (NH) residents in California from 2011 to 2016.

Methods: California requires NHs to document in the Minimum Data Set whether residents complete a POLST and orders within POLST. Using a serial cross-sectional design for each year, we describe POLST completion and orders for all California NH residents from 2011 to 2016 (N=1,112,668). We used logistic mixed-effects regression models to estimate POLST completion and resuscitation orders to understand the relationship with resident and facility characteristics, including Centers for Medicare and Medicaid Services (CMS) Nursing Home Compare overall five-star quality rating.

Results: POLST completion significantly increased from 2011 to 2016 with most residents having a POLST in 2016 (short-stay:68%; long-stay:81%). Among those with a POLST in 2016, 54% of long-stay and 41% of short-stay residents had a DNR order. Among residents with DNR, >90% had orders for limited medical interventions or comfort measures. Few residents (<6%) had a POLST with contradictory orders. In regression analyses, POLST completion was greater among residents with more functional dependence, but was lower among those with more cognitive impairment. Greater functional and cognitive impairment were associated with DNR

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orders. Racial and ethnic minorities indicated more aggressive care preferences. Higher CMS five-star facility quality rating was associated with greater POLST completion.

Conclusions: Six years after a state mandate to document POLST completion in NHs, most California NH residents have a POLST, and about half of long-stay residents have orders to limit life-sustaining treatment. Future work should focus on determining the quality of care preference decisions documented in POLST.

Keywords

end-of-life care; POLST; nursing home; long-term care; quality improvement

INTRODUCTION

Physician Orders for Life-Sustaining Treatment (POLST) – or more colloquially portable medical orders or just POLST – facilitate documentation of patients’ life-sustaining treatment preferences and are designed to improve transition of these preferences, in the form of physician orders, across care settings. Unlike other forms of advance care planning preference documentation, POLST contains physician or advanced practice provider orders. In California, POLST captures orders concerning cardiopulmonary resuscitation (CPR), overall aggressiveness of care, hospital transfer, and artificial nutrition, including feeding tubes. POLST implementation is a national endeavor. Currently, all U.S. states and Washington D.C. have developed some type of POLST form available to residents, and 45 states are recognized as active or endorsed programs by the National POLST Program.^{1,2} POLST is intended for use among persons at risk for a life-threatening clinical event because they have a serious life-limiting medical condition or advanced frailty.³

Beginning in 2011, California became the first state to mandate that nursing homes document residents’ POLST responses in the Minimum Data Set (MDS), a standardized, federally mandated screening and health status assessment tool completed for all residents in a Medicare and/or Medicaid-certified long-term care facility.⁴ Prior analysis of the California MDS data demonstrated that by the end of 2011, 49% of California nursing home residents had completed a POLST⁵ but with wide variation in POLST completion among nursing home facilities.⁶ Less is known about facility and patient factors influencing POLST completion and care preferences.⁷

In the current study, we describe POLST completion and care preferences among nursing home residents in California over a six-year period from 2011 to 2016, accounting for patient and facility characteristics and year of MDS assessment.

METHODS

Overview

Using a cross-sectional design for each observation year, we described POLST completion, the physician orders regarding resuscitation status and level of medical intervention contained in the last reported California MDS Section S for nursing home residents in each year from 2011 to 2016 (N=1,112,668 unique residents across all years). We employed

logistic mixed-effects regression analyses to estimate the impact of patient- and facility-level characteristics and trends over time regarding POLST completion and choice of DNR order, stratified by resident length of stay.

Data Sources

The federally mandated MDS collects detailed demographic and clinical information on admission to the nursing home, quarterly, if there is a significant change in clinical status, and at discharge or death. A supplemental section containing questions about the use of POLST (Section S) was added to the California MDS on October 1, 2010. Section S includes whether or not the resident completed a POLST and the content of the POLST form, including:

- Part A: Resuscitation status (do not resuscitate vs. attempt resuscitation),
- Part B: Desired level of medical intervention (comfort measures vs. limited interventions vs. full treatment), and
- Part C: Choice about artificial nutrition, including feeding tubes (no artificial nutrition vs. trial of artificial nutrition vs. long-term artificial nutrition).⁸

For those residents with a valid completed POLST, defined as having an order in Part A and signatures of both the resident (or appropriate proxy) and physician/advanced practice provider,⁹ we described the orders contained in the POLST for the last Section S completed in each year. Descriptive statistics were used to examine all possible combinations of resuscitation status and level of intervention recorded in Section S.

Resident characteristics were derived from the MDS. These included gender, age at time of assessment, and race/ethnicity (categorized as non-Hispanic White, non-Hispanic Black, Hispanic, Asian/Pacific Islander, and other/unknown). Cognitive status was defined using the Cognitive Function Scale, a hybrid measure that augments non-response to the prospective validated MDS 3.0 Brief Interview for Mental Status (BIMS)¹⁰ with item responses from the MDS 3.0 to create a four-level cognitive measure (intact, mild impairment, moderate impairment, severe impairment).¹¹ To define functional status, we used the validated MDS Activities of Daily Living (ADL) scale, which ranges from 0 (independent in all seven ADLs) to 28 (total dependence in all seven ADLs)¹² to create a four-level categorical variable (0 to 7, 8 to 14, 15 to 21, 22 to 28). Demographic and clinical variables and Section S variables were drawn from the same MDS assessment except if ADL and cognitive assessments were unavailable, in which case they were taken from another MDS assessment collected during a 90-day window around the Section S assessment. Long-stay was defined as residing in a nursing home for greater than 100 days within a continuous 365-day period.¹³ Once classified as long-stay, individuals were considered long-stay residents after the initial 365-day period.

We used CMS Nursing Home Compare (NHC) data¹⁴ to obtain facility CMS overall five-star quality rating, nursing home profit status, and nursing home size (number of licensed beds). Overall five-star quality rating for each facility is calculated by CMS using nursing home health inspection survey data, nurse staffing levels, and facility quality measure performance based on MDS 3.0 assessments.¹⁵ Nursing home profit status was defined

as a dichotomous variable in all models (for profit vs. non-profit or government). We defined nursing home size as a categorical variable (0 to 50 beds, 51 to 100 beds, 101 to 150 beds, and >150 beds). Facility characteristics were linked according to the quarter of NHC data corresponding to the date the last Section S was completed for each resident. Because of changes to how MDS assessments are conducted¹⁶ (starting in October 2010), first quarter NHC quality data for 2011 are not publicly available,¹⁷ and values from fourth quarter of 2010 were used in place of the first quarter of 2011.

Data Analysis

Nursing home resident- and facility-level characteristics were summarized by resident length of stay per year (2016 data are shown in Table 1, other years are shown in Supplementary Tables S1 and S2). Logistic mixed-effects regression models, stratified by resident length of stay, were used to estimate (1) POLST completion among all residents and (2) DNR order among those with a completed POLST. Each regression model included resident-level random-effects that accounted for multiple observations within residents and facility-level fixed-effects that accounted for multiple residents within facilities. Each regression model was further adjusted for the following covariates: year of observation (2011-2016), resident characteristics (age, gender, race/ethnicity, cognition, and functional status), and facility characteristics (size, profit status, and CMS overall five-star quality rating for the quarterly time period when the observation took place).

Stratified analyses were performed as sensitivity analyses to further explore whether time trends of DNR order preference among residents with completed POLSTs might differ by race/ethnicity using the same regression modeling approach. Results from the stratified analyses did not alter the findings and conclusions of the main analyses, and thus only the main analyses are presented.

Analyses were performed using the SAS System version 9.4 (SAS Institute Inc., Cary, NC, USA) and graphs were generated using the publicly available statistical software R.¹⁸ This project was approved by the UCLA Human Research Protection Program (#17-001534), the California Committee for the Protection of Human Subjects (#2018-216-UCLA), and the CMS Institutional Review Board (#RSCH-2018-52277).

RESULTS

Of the 322,181 California nursing home residents who had a Section S in 2016 (the most recent year of this analysis), 112,109 (35%) were long-stay residents and 210,072 (65%) were short-stay (Table 1). Among long-stay residents, the mean age was 76.7 years, 60% were female, and 40% were racial or ethnic minorities. Many patients had cognitive or functional disabilities – 46% were moderately or severely cognitively impaired and 75% were moderately or severely functionally impaired. Half of patients resided in higher quality (4 or 5 star) facilities, and most (87%) were residents of for-profit facilities. The majority of patients (56%) were in nursing homes with 100 or fewer beds. Although short-stay residents had a similar mean age (76.6 years) and gender distribution (58% female) as long-stay residents, other population characteristics differed. There were fewer racial or ethnic minority short-stay patients (28% vs. 40%), fewer with moderate or severe cognitive

impairment (16% vs. 46%), and more with moderate (54% vs. 45%) and fewer with severe (8.5% vs. 30%) functional impairment. More short-stay patients (60% vs. 50%) were treated in higher quality facilities.

POLST Completion and Care Preferences

POLST completion was greater among long-stay nursing home residents on average, and increased between 2011 and 2016 for both long-stay and short-stay residents. Among long-stay residents, POLST completion increased from 63% to 81%, while it increased from 50% to 68% for short-stay patients (Figure 1). Among residents with a valid POLST, care preferences were largely similar across years. More long-stay residents had DNR orders, which decreased from 56% in 2011 to 54% in 2016. Similarly, among short-stay patients, DNR orders decreased slightly from 42% to 41%. The vast majority of patients with a DNR order also had orders for limited medical interventions or comfort measures (95% among long-stay residents and 93% among short-stay residents, Table 2). Across all years, few residents (< 6%) had a POLST with conflicting orders: CPR in Part A and limited interventions or comfort care in Part B.

Factors Associated with POLST Completion

In mixed-effects regression analyses (Table 3), we found that for long-stay residents, individual characteristics associated with greater POLST completion included: older age (OR 1.13; 95% CI 1.12 to 1.14), female gender (OR 1.03; 95% CI 1.01 to 1.04), Hispanic ethnicity (OR 1.09, 95% CI 1.06 to 1.11), and greater functional impairment (OR 1.39; 95% CI 1.35 to 1.44 for those with the greatest functional dependence as compared to those with the least dependence). Individuals with cognitive impairment were less likely to complete a POLST compared to those without cognitive impairment (OR 0.89; 95% CI: 0.86 to 0.91 for those with the greatest cognitive impairment). A higher CMS five-star quality facility rating was associated with greater odds of POLST completion as compared to facilities with a one-star rating. There was not a consistent relationship between POLST completion and facility ownership or nursing home size. After adjusting for patient and facility characteristics, POLST completion was more likely after 2011, with higher adjusted odds compared to 2011 for each subsequent year (OR ranges from 1.72 in 2012 to 5.69 in 2016 for long-stay residents). In the adjusted regression analysis of short-stay residents, results were similar to long-stay residents but certain predictors were not significant (female gender and Hispanic ethnicity).

Factors Associated with a POLST containing a DNR Order

In mixed-effects logistic regression analyses of DNR orders among long-stay residents with a valid POLST (Table 4), we found that increasing age, female gender, being non-Hispanic White, increasing cognitive impairment, and increasing functional impairment were associated with greater odds of having a DNR order. Facility characteristics were not significantly associated with having a DNR order, although there was a trend towards selecting DNR in not-for-profit facilities. In these adjusted analyses, short-stay residents had similar factors associated with DNR orders compared to long-stay residents, although contrasts were greater for impaired cognition and function among short-stay residents. While DNR orders decreased over time in unadjusted results, in adjusted models, long- and

short-stay residents in years subsequent to 2011 had slightly greater odds of having a DNR order after adjusting for patient and facility characteristics.

DISCUSSION

In this investigation, we demonstrated that POLST completion in the statewide California nursing home population significantly increased between 2011 and 2016 with over 80% of long-stay residents having a completed POLST in 2016 with a larger absolute population of residents with valid full care (CPR) orders. While POLST completion was not required in California, the high rate of completion seen in this study may be in part related to the integration of POLST completion into the MDS, a mandatory, regulatory assessment completed for all nursing home residents. Few POLST forms (<6%) had contradictory orders, consistent with prior studies examining the quality of POLST completion in other states.^{19–22}

POLST completion was greater among nursing home residents with more functional dependence, but was lower among those with greater cognitive impairment. This finding was noted in a prior study by this group looking only at 2011 California MDS data,⁵ and is unchanged five years later. Lower POLST completion among residents with cognitive impairment continues to be a quality of care issue in the nursing home setting, and may be related to the need to identify and engage a proxy decision-maker in POLST completion, uncertainty about the person's care preferences, or a previously documented preference for aggressive care. Non-completion of POLST is equivalent to aggressive care (i.e., CPR). This is especially important among long-stay residents, who are less likely to be able to state treatment preferences due to poor health, and risk receiving intensive care that may be inconsistent with their values and wishes.

Consistent with prior studies,^{23–27} resuscitation and treatment orders for older and more functionally and cognitively impaired individuals were less intense. However, in 2016, close to half (46%) of long-stay nursing home residents had a POLST CPR order. Given that long-term care nursing home residents have overall poorer health and prognosis, it is unexpected that high quality advance care planning conversations would yield such a high proportion of long-stay residents with CPR orders. This is a greater preference for CPR than seen in early evaluations of POLST in the nursing home setting²⁸ and matches recent trends of more aggressive life-sustaining care preferences recorded in POLST forms reported by others.²⁹ Studies have demonstrated that end-of-life care wishes documented in POLST forms are largely concordant with subsequent care delivered.³⁰ Due to concern for potential harm from poor quality POLST completion leading to discordance between POLST orders and actual patient care preferences,³¹ some have proposed limiting POLST use to only those who desire comfort-focused care with an expected clinical trajectory toward end-of-life.^{29,32,33}

Black, Hispanic, and Asian nursing home residents were far less likely than non-Hispanic Whites to choose lower intensity care in the study population, but were similarly or more likely to complete a POLST. Much more work is needed to explore whether this variation is due to differences in understanding, issues with trust, health literacy, or other factors. These

findings are analogous to the use of early DNR orders among older hospitalized patients in California, an overlapping population with the current study population.³⁴

Greater POLST completion among higher quality facilities (i.e., higher CMS star rating)^{35,36} speaks to the structures and processes needed to support advance care planning, including the use of POLST, in the nursing home setting. These include availability of and familiarity with POLST forms, initiation of high-quality POLST discussions with residents and their caregivers, and implementation of best practices around POLST completion and review, especially with transfers in and out of a facility or with a change in resident clinical condition.³⁶ This finding is consistent with the idea that facilities focused on care quality will be more likely to address avoidance of undesirable care as consistent with a patient's wishes and document these preferences.

The current study has a number of limitations. The study is limited to patients in nursing homes in a single, albeit large, state that requires administrative reporting of POLST completion and treatment orders. These findings may not be generalizable to other states. The study reflects data from 2011 to 2016, which may not reflect more recent COVID-19 pandemic-driven changes in POLST completion and care preferences. Nevertheless, the study strengths include a large number of patients and facilities, and novel reporting of POLST completion and contents across all nursing home patients.

Comprehensive data on POLST use in California nursing homes demonstrates high rates of POLST completion particularly among long-stay residents, but with only about half of long-stay residents limiting life-sustaining treatment. Future work should continue to focus on determining the quality of decisions documented in POLST particularly among long-stay residents with poor overall health and prognosis, and how these care decisions translate into outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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REFERENCES

1. National POLST Maps. 2021. (Accessed July 26, 2021, at <https://polst.org/programs-in-your-state/>.)
2. Tark A, Agarwal M, Dick AW, Stone PW. Variations in Physician Orders for Life-Sustaining Treatment Program across the Nation: Environmental Scan. *J Palliat Med* 2019;22:1032–8. [PubMed: 30789297]
3. Intended Population & Guidance for Health Care Professionals. 2019. (Accessed January 28, 2022, at <https://polst.org/wp-content/uploads/2020/03/2019.01.14-POLST-Intended-Population.pdf>.)

4. Long Term Care Minimum Data Set 3.0. (Accessed July 15, 2021, 2021, at <https://resdac.org/cms-data/files/mds-30>.)
5. Jennings LA, Zingmond D, Louie R, et al. Use of the Physician Orders for Life-Sustaining Treatment among California Nursing Home Residents. *Journal of General Internal Medicine* 2016;31:1119–26. [PubMed: 27188700]
6. Rahman AN, Bressette M, Enguidanos S. Quality of Physician Orders for Life-Sustaining Treatment Forms Completed in Nursing Homes. *Journal of Palliative Medicine* 2017;20:538–41. [PubMed: 27841953]
7. Hickman SE, Sudore RL, Sachs GA, et al. Use of the Physician Orders for Scope of Treatment Program in Indiana Nursing Homes. *Journal of the American Geriatrics Society* 2018;66:1096–100. [PubMed: 29566429]
8. Physician Orders for Life Sustaining Treatment Form-California 2020. at https://capolst.org/wp-content/uploads/2020/10/POLST_2017_wCover.pdf.)
9. California State Assembly Bill No. 3000, Ch. 266. 2007-2008. (Accessed January 31, 2017, at http://www.leginfo.ca.gov/pub/07-08/bill/asm/ab_2951-3000/ab_3000_bill_20080804_chaptered.pdf.)
10. Chodosh J, Edelen MO, Buchanan JL, et al. Nursing home assessment of cognitive impairment: development and testing of a brief instrument of mental status. *Journal of the American Geriatrics Society* 2008;56:2069–75. [PubMed: 19016941]
11. Thomas KS, Dosa D, Wysocki A, Mor V. The Minimum Data Set 3.0 Cognitive Function Scale. *Med Care* 2017;55:E68–E72. [PubMed: 25763665]
12. Morris JN, Fries BE, Morris SA. Scaling ADLs within the MDS. *The journals of gerontology Series A, Biological sciences and medical sciences* 1999;54:M546–53. [PubMed: 10619316]
13. International R. MDS 3.0 Quality Measures User’s Manual MDS 3.0 v5.0. 2012 March 1, 2012.
14. Nursing Home Compare Datasets. (Accessed January 31, 2017, at <https://data.medicare.gov/data/nursing-home-compare>.)
15. Design for Nursing Home Compare Five-Star Quality Rating System: Technical Users’ Guide, January 2017. (Accessed January 31, 2017, at <https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/downloads/usersguide.pdf>.)
16. Saliba D, Jones M, Streim J, Ouslander J, Berlowitz D, Buchanan J. Overview of Significant Changes in the Minimum Data Set for Nursing Homes Version 3.0. *J Am Med Dir Assoc* 2012;13:595–601. [PubMed: 22784698]
17. Centers for Medicare and Medicaid Services Nursing Home Five-Star Quality Rating System. NHC QM File 2011 Q2 - Q4. (Accessed January 31, 2017, at <https://www.cms.gov/medicare/provider-enrollment-and-certification/certificationandcompliance/fsqrs.html>.)
18. R Core Team. R: A language and environment for statistical computing. R Foundation for Statistical Computing Vienna, Austria 2020.
19. Lee RY, Modes ME, Sathitratanaheewin S, Engelberg RA, Curtis JR, Kross EK. Conflicting Orders in Physician Orders for Life-Sustaining Treatment Forms. *J Am Geriatr Soc* 2020;68:2903–8. [PubMed: 32936447]
20. Moss AH, Zive DM, Falkenstine EC, Dunithan C. The Quality of POLST Completion to Guide Treatment: A 2-State Study. *J Am Med Dir Assoc* 2017;18.
21. Schmidt TA, Zive D, Fromme EK, Cook JNB, Tolle SW. Physician Orders for Life-Sustaining Treatment (POLST): Lessons learned from analysis of the Oregon POLST Registry. *Resuscitation* 2014;85:480–5. [PubMed: 24407052]
22. Tarzian AJ, Cheevers NB. Maryland’s Medical Orders for Life-Sustaining Treatment Form Use: Reports of a Statewide Survey. *Journal of Palliative Medicine* 2017;20:939–45. [PubMed: 28375815]
23. de Decker L, Annweiler C, Launay C, Fantino B, Beauchet O. Do not resuscitate orders and aging: impact of multimorbidity on the decision-making process. *J Nutr Health Aging* 2014;18:330–5. [PubMed: 24626763]
24. Gonzalez-Gonzalez AI, Schmucker C, Nothacker J, et al. End-of-Life Care Preferences of Older Patients with Multimorbidity: A Mixed Methods Systematic Review. *J Clin Med* 2020;10.

25. Houben CHM, Spruit MA, Schols J, Wouters EFM, Janssen DJA. Instability of Willingness to Accept Life-Sustaining Treatments in Patients With Advanced Chronic Organ Failure During 1 Year. *Chest* 2017;151:1081–7. [PubMed: 28007621]
26. Janssen DJA, Spruit MA, Schols J, Wouters EFM. A call for high-quality advance care planning in outpatients with severe COPD or chronic heart failure. *Chest* 2011;139:1081–8. [PubMed: 20829337]
27. Janssen DJA, Spruit MA, Schols JMGA, van der Sande FM, Frenken LA, Wouters EFM. Insight Into Advance Care Planning for Patients on Dialysis. *J Pain Symptom Manag* 2013;45:104–13.
28. Hickman SE, Tolle SW, Brummel-Smith K, Carley MM. Use of the physician orders for life-sustaining treatment program in oregon nursing facilities: Beyond resuscitation status. *Journal of the American Geriatrics Society* 2004;52:1424–9. [PubMed: 15341541]
29. Zive DM, Jimenez VM, Fromme EK, Tolle SW. Changes Over Time in the Oregon Physician Orders for Life-Sustaining Treatment Registry: A Study of Two Decedent Cohorts. *Journal of Palliative Medicine* 2019;22:500–7. [PubMed: 30484728]
30. Tark A, Song J, Parajuli J, Chae S, Stone PW. Are We Getting What We Really Want? A Systematic Review of Concordance Between Physician Orders for Life-Sustaining Treatment (POLST) Documentation and Subsequent Care Delivered at End-of-Life. *Am J Hosp Palliat Me* 2020.
31. Hickman SE, Torke AM, Smith NH, et al. Reasons for discordance and concordance between POLST orders and current treatment preferences. *Journal of the American Geriatrics Society* 2021.
32. Hickman SE, Torke AM, Sachs GA, et al. Factors associated with concordance between POLST orders and current treatment preferences. *Journal of the American Geriatrics Society* 2021.
33. Hickman SE, Steinberg K, Carney J, Lum HD. POLST Is More Than a Code Status Order Form: Suggestions for Appropriate POLST Use in Long-Term Care. *J Am Med Dir Assoc* 2021;22:1672–7. [PubMed: 34029523]
34. Zingmond DS, Wenger NS. Regional and institutional variation in the initiation of early do-not-resuscitate orders. *Arch Intern Med* 2005;165:1705–12. [PubMed: 16087817]
35. Hickman SE, Hammes BJ, Torke AM, Sudore RL, Sachs GA. The Quality of Physician Orders for Life-Sustaining Treatment Decisions: A Pilot Study. *Journal of Palliative Medicine* 2017;20:155–62. [PubMed: 27802064]
36. Hickman SE, Keevern E, Hammes BJ. Use of the Physician Orders for Life-Sustaining Treatment Program in the Clinical Setting: A Systematic Review of the Literature. *Journal of the American Geriatrics Society* 2015;63:341–50. [PubMed: 25644280]

Key Points:

- Six years after integration of POLST into the Minimum Data Set in California nursing homes, 81% of long-stay residents have a POLST, but only half (54%) have orders limiting life-sustaining treatments.

Why Does This Paper Matter?

Aggressive care preferences were unexpectedly high for a long-term care population with overall poor prognosis.

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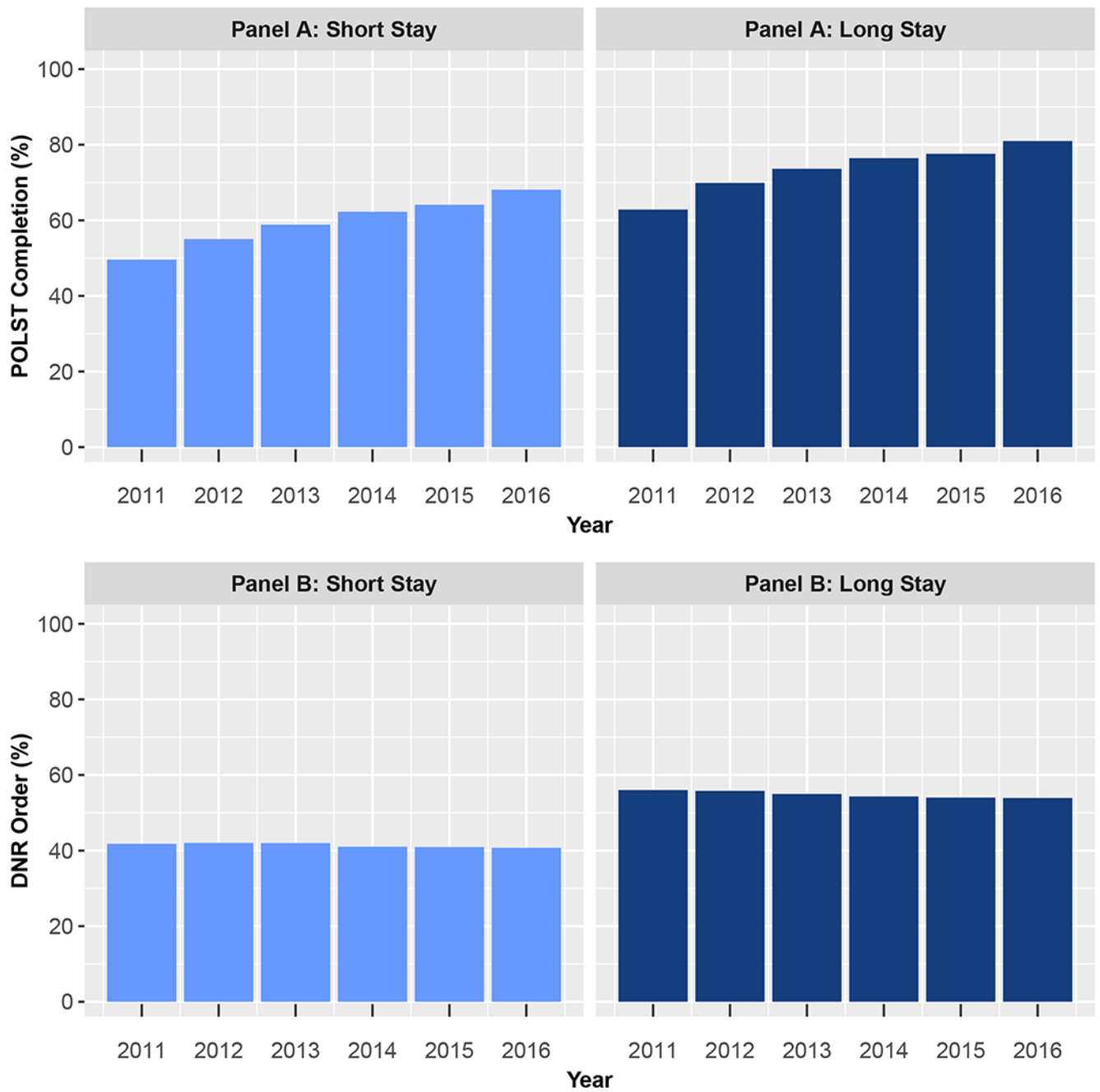


Figure 1. POLST Completion & Cardiopulmonary Resuscitation Preference among California Nursing Home Residents by Length of Stay from 2011 to 2016

Panel A shows the trend in POLST completion (%) among all California nursing home residents from 2011 to 2016 stratified by length of stay (unadjusted).

Panel B shows the percentage of nursing home residents who indicated a preference for DNR among those with a completed POLST (unadjusted).

Table 1:
California Nursing Home Resident Characteristics, 2016

	Short Stay (N= 210,072)		Long Stay (N= 112,109)	
Age, in years (mean, SD)	76.6	13.1	76.7	14.9
Female (N, %)	121,084	57.6	66,712	59.5
Race/Ethnicity (N, %)				
Non-Hispanic White	138,917	66.1	62,839	56.1
Black	14,515	6.9	13,087	11.7
Hispanic	28,210	13.4	19,429	17.3
Asian/PI	16,131	7.7	12,491	11.1
Other/Unknown	12,299	5.9	4,263	3.8
Cognitive Impairment (N, %)				
Intact	131,948	62.8	39,535	35.3
Mildly impaired	33,861	16.1	20,533	18.3
Moderately impaired	25,915	12.3	33,481	29.9
Severely impaired/ dependent	7,403	3.5	17,997	16.1
Missing	10,945	5.2	563	0.5
Activities of Daily Living (N, %)				
Score 0-7 (Least Dependent)	19,853	9.5	11,887	10.6
Score 8-14	57,027	27.2	16,398	14.6
Score 15-21	113,511	54.0	50,496	45.0
Score 22+ (Most Dependent)	17,929	8.5	33,319	29.7
Missing	1,752	0.8	9	0.0
Nursing Home Quality Rating (N, %)				
1 Star	13,408	6.4	11,108	9.9
2 Star	38,739	18.4	24,606	22.0
3 Star	31,681	15.1	19,608	17.5
4 Star	51,248	24.4	26,309	23.5
5 Star	74,836	35.6	30,239	27.0
Missing	160	0.1	239	0.2
Facility Ownership / Control (N, %)				
For-Profit	183,111	87.2	97,834	87.3
Non-Profit or Government Owned	26,914	12.8	14,236	12.7
Unknown	47	0.0	39	0.0
Residents per Facility (N, %)				
0-50	29,676	14.1	10,783	9.6
51-100	99,270	47.3	51,876	46.3
101-150	57,386	27.3	29,079	25.9
151+	23,693	11.3	20,332	18.1

	Short Stay (N= 210,072)		Long Stay (N= 112,109)	
Missing	47	0.0	39	0.0

Data reflect characteristics reported in the last Section S MDS assessment completed in 2016 for each resident. CMS Nursing Home Compare data were used from the quarter that Section S was completed for each resident. Data include 1248 California nursing home facilities. Resident characteristics for years 2011-2015 are provided in Supplementary Tables S1 (short-stay) and S2 (long-stay).

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Table 2:

Orders contained in Completed POLSTs among California Nursing Home Residents, 2011 to 2016

Resuscitation Status (Part A)	Level of Intervention (Part B)	2011	2012	2013	2014	2015	2016
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Short-stay							
DNR	Comfort care	14,799 (16.8)	17,004 (17.0)	18,966 (17.0)	19,808 (16.4)	21,270 (16.6)	23,333 (16.3)
DNR	Limited	20,093 (22.8)	22,980 (22.9)	25,739 (23.1)	26,613 (22.0)	27,029 (21.1)	30,599 (21.4)
DNR	Full	1,991 (2.3)	2,150 (2.1)	2,102 (1.9)	3,167 (2.6)	4,201 (3.3)	4,341 (3.0)
CPR	Full	46,882 (53.1)	53,833 (53.7)	60,481 (54.3)	66,780 (55.2)	71,294 (55.6)	79,733 (55.7)
CPR	Comfort or Limited	4,540 (5.1)	4,274 (4.3)	4,184 (3.8)	4,509 (3.7)	4,495 (3.5)	5,074 (3.5)
Long-stay							
DNR	Comfort care	18,319 (25.5)	21,901 (25.8)	23,301 (25.7)	22,647 (24.0)	24,081 (24.8)	23,209 (25.6)
DNR	Limited	20,275 (28.2)	23,799 (28.0)	25,053 (27.6)	23,788 (25.2)	24,895 (25.7)	23,197 (25.6)
DNR	Full	1,652 (2.3)	1,691 (2.0)	1,523 (1.7)	4,772 (5.1)	3,389 (3.5)	2,540 (2.8)
CPR	Full	28,538 (39.7)	34,466 (40.6)	37,924 (41.8)	39,857 (42.3)	41,839 (43.2)	39,428 (43.4)
CPR	Comfort or Limited	3,071 (4.3)	3,080 (3.6)	2,924 (3.2)	3,194 (3.4)	2,731 (2.8)	2,414 (2.7)

Data reflect the last Section S MDS assessment completed in 2011-2016 for each patient.

A completed POLST was defined as having a resuscitation status order in Part A and resident (or proxy) and physician signatures present.

Because the default clinical intervention is full intervention if no care preference is indicated, Part B not completed was grouped with full intervention.

Table 3:

Adjusted Odds Ratios for POLST Completion among California Nursing Home Residents, 2011-2016

	Short-Stay (N= 1,097,492)			Long-Stay (N= 710,212)				
	OR	95% CI	p-value	OR	95% CI	p-value		
Year								
2011	ref			ref				
2012	1.31	1.29	1.34	<.001	1.72	1.68	1.76	<.001
2013	1.58	1.56	1.61	<.001	2.38	2.33	2.44	<.001
2014	1.92	1.89	1.96	<.001	3.15	3.07	3.23	<.001
2015	2.13	2.10	2.17	<.001	3.60	3.51	3.69	<.001
2016	2.77	2.72	2.82	<.001	5.69	5.54	5.85	<.001
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Age (in 10 Years)	1.09	1.08	1.09	<.001	1.13	1.12	1.14	<.001
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Female	1.00	0.99	1.01	0.862	1.03	1.01	1.04	<.001
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Race/Ethnicity								
Non-Hispanic White	ref			ref				
Black	1.01	0.99	1.03	0.233	1.02	0.99	1.04	0.200
Hispanic	1.00	0.99	1.02	0.640	1.09	1.06	1.11	<.001
Asian/Pacific Islander	1.01	0.99	1.03	0.418	1.04	1.01	1.07	0.012
Other/Unknown	0.83	0.81	0.85	<.001	0.87	0.84	0.91	<.001
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Cognitive Status								
Intact	ref			ref				
Mildly impaired	0.88	0.87	0.89	<.001	0.87	0.85	0.89	<.001
Moderately impaired	0.97	0.96	0.99	<.001	0.86	0.84	0.88	<.001
Severely impaired	0.95	0.93	0.98	<.001	0.89	0.86	0.91	<.001
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Activities of Daily Living								
Score 0-7 (least dependent)	ref			ref				
Score 8-14	1.00	0.99	1.02	0.698	1.20	1.17	1.24	<.001
Score 15-21	1.04	1.02	1.06	<.001	1.26	1.22	1.29	<.001
Score 22+ (most dependent)	1.15	1.12	1.18	<.001	1.39	1.349	1.438	<.001
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Facility Star Rating								
1 Star	ref			ref				
2 Star	1.11	1.09	1.13	<.001	1.11	1.08	1.14	<.001
3 Star	1.03	1.01	1.06	0.011	1.05	1.02	1.09	0.004
4 Star	1.09	1.06	1.11	<.001	1.04	1.00	1.07	0.042
5 Star	1.06	1.04	1.09	<.001	1.13	1.09	1.18	<.001
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Facility Ownership/Control								
For-Profit	ref			ref				
Non-Profit or Gov	0.97	0.91	1.03	0.243	1.08	0.96	1.22	0.179

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	Short-Stay (N= 1,097,492)			Long-Stay (N= 710,212)		
	OR	95% CI	p-value	OR	95% CI	p-value
Residents per Facility						
0-50	ref			ref		
51-100	0.95	0.91 0.99	0.014	0.88	0.82 0.95	<.001
101-150	1.19	1.13 1.26	<.001	1.22	1.11 1.34	<.001
151+	1.09	1.02 1.17	0.007	1.10	0.98 1.22	0.102

A completed POLST was defined as having a resuscitation status order in Part A and resident (or proxy) and physician/advanced practice provider signatures present.

Separate logistic mixed-effects regression models with resident-level random-effects were used. Individual and facility characteristics shown were included as fixed-effects.

1,236 facilities were included in the long-stay model and 1,237 facilities were included in the short-stay model.

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Table 4:

Adjusted Odds Ratios for DNR Preference among California Nursing Home Residents with a Completed POLST, 2011-2016

	Short-Stay (N= 669,012)			Long-Stay (N= 523,585)		
	OR	95% CI	p-value	OR	95% CI	p-value
Year						
2011	ref			ref		
2012	1.06	1.04 1.09	<.001	1.03	1.00 1.05	0.036
2013	1.10	1.08 1.12	<.001	1.02	1.00 1.04	0.113
2014	1.11	1.09 1.14	<.001	1.03	1.01 1.06	0.017
2015	1.11	1.09 1.13	<.001	1.03	1.01 1.06	0.012
2016	1.09	1.07 1.12	<.001	1.04	1.01 1.06	0.003
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Age (in 10 Years)	1.74	1.73 1.75	<.001	1.65	1.64 1.66	<.001
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Female	1.10	1.09 1.12	<.001	1.03	1.01 1.04	<.001
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Race/Ethnicity						
Non-Hispanic White	ref			ref		
Black	0.42	0.41 0.43	<.001	0.37	0.37 0.38	<.001
Hispanic	0.52	0.50 0.52	<.001	0.56	0.58 0.57	<.001
Asian/Pacific Islander	0.52	0.51 0.54	<.001	0.57	0.55 0.58	<.001
Other/Unknown	0.76	0.74 0.78	<.001	0.66	0.64 0.68	<.001
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Cognitive Status						
Intact	ref			ref		
Mildly impaired	1.38	1.36 1.40	<.001	1.27	1.25 1.29	<.001
Moderately impaired	2.05	2.01 2.09	<.001	1.71	1.68 1.75	<.001
Severely impaired	2.96	2.87 3.06	<.001	2.40	2.34 2.46	<.001
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Activities of Daily Living						
Score 0-7 (least dependent)	ref			ref		
Score 8-14	1.08	1.06 1.11	<.001	1.06	1.03 1.09	<.001
Score 15-21	1.45	1.42 1.49	<.001	1.30	1.27 1.33	<.001
Score 22+ (most dependent)	2.51	2.43 2.58	<.001	1.85	1.79 1.90	<.001
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Facility Star Rating						
1 Star	ref			ref		
2 Star	0.97	0.95 1.00	0.031	0.98	0.96 1.01	0.160
3 Star	0.98	0.95 1.01	0.134	1.00	0.97 1.03	0.801
4 Star	0.98	0.95 1.01	0.215	1.00	0.95 1.01	0.132
5 Star	0.99	0.96 1.02	0.490	1.01	0.97 1.04	0.705
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Facility Ownership/Control						
For-Profit	ref			ref		

	Short-Stay (N= 669,012)			Long-Stay (N= 523,585)		
	OR	95% CI	p-value	OR	95% CI	p-value
Non-Profit or Gov	1.08	1.00 1.16	0.048	1.10	1.00 1.22	0.056
Residents per Facility						
0-50	ref			ref		
51-100	0.99	0.95 1.03	0.656	1.02	0.95 1.08	0.636
101-150	0.96	0.91 1.02	0.229	0.98	0.91 1.07	0.670
151+	0.94	0.87 1.01	0.090	0.94	0.86 1.03	0.194

Analyses restricted to residents with a completed POLST. A completed POLST was defined as having a resuscitation status order in Part A and resident (or proxy) and physician/advanced practice provider signatures present.

Separate logistic mixed-effects regression models with resident-level random-effects were used. Individual and facility characteristics shown were included as fixed-effects.

1,193 facilities were included in the long-stay model and 1,215 facilities were included in the short-stay model.