Published in final edited form as:

J Am Med Dir Assoc. 2017 October 01; 18(10): 885–890. doi:10.1016/j.jamda.2017.05.021.

Use of Medical Orders for Scope of Treatment for Heart Failure Patients During Postacute Care in Skilled Nursing Facilities

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Abstract

Background—Individuals with heart failure (HF) who are hospitalized and admitted to skilled nursing facilities (SNFs) are at high risk for rehospitalization and death. The care preferences of this high-risk population have not been studied.

Objectives—To describe care preferences of patients with HF admitted to SNFs for rehabilitation based on Medical Orders for Scope of Treatment (MOST) documentation, and evaluate goal-concordant care based on MOST documentation, emergency department (ED) visits, and hospitalization.

Design, setting, and participants—Retrospective study of patients with HF in 35 SNFs enrolled in a randomized controlled trial of HF-disease management versus usual care between July 2014 and May 2016.

Measurements—Validity of MOST forms, care preference documentation, and ED visits/hospitalizations within 60 days of SNF admission.

Results—Of 370 patients (mean age 78.6 years, 58% women, 25% systolic HF), 278 (75%) had a MOST form in the SNF chart, of which 96 forms (35%) were invalid. The most common reason for an invalid MOST form was missing date accompanying patient or provider signature. Of 182 valid MOST forms, 47% of patients chose no cardiopulmonary resuscitation (“No CPR”), 58% selected “Full Treatment,” 17% chose “Selective Treatment,” and 23% chose “Comfort-Focused Treatment.” Patients who were older [odds ratio (OR) = 1.50, 95% confidence interval (CI) = 1.25, 1.81] and female (OR = 2.33, 95% CI = 1.18, 4.59) had higher odds of choosing “No CPR.” Sixty-

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The authors declare no conflicts of interest.

Supplementary Data

Supplementary data related to this article can be found online at <http://dx.doi.org/10.1016/j.jamda.2017.05.021>.

six of 182 patients (36%) with valid MOST forms had an ED/hospital visit within 60 days of SNF admission; only 3 patients received medical care that was potentially discordant: all 3 chose “Comfort-Focused Treatment” and were hospitalized for more than symptom management.

Conclusion—Seventy-five percent of patients with HF admitted to SNFs had care preferences documented using the MOST form, and 95% received goal-concordant care based on care preferences documented during the SNF admission. Clinicaltrials.gov # NCT01822912.

Keywords

POLST; heart failure; advance directives; subacute rehabilitation; skilled nursing facility; goal-concordant care

Heart failure (HF) is a progressive, debilitating disease with frequent hospitalizations, care transitions, and high mortality. A national HF registry showed that approximately two-thirds of patients admitted for acute decompensated HF were rehospitalized within 1 year and one-third died.¹ In addition, 1 in 5 patients hospitalized for HF is discharged to a skilled nursing facility (SNF).² HF patients who were discharged to SNFs demonstrated a 14% 30-day mortality and a 54% 1-year mortality.² In contrast, patients who were discharged home had a 4% 30-day mortality and a 29% 1-year mortality.² There is a critical need to elicit, document, and provide medical care that aligns with individual preferences, especially in the SNF setting where patients have functional limitations and high risk of mortality.

The Medical Orders for Scope of Treatment (MOST) form is a tool to assist with decisions, documentation, and communication about specific medical care preferences. As part of the national Physician Orders for Life-Sustaining Treatment (POLST) program,³ the MOST form was introduced in Colorado in 2010 via statute 15–18.7 and revised in April 2015.⁴ Many studies have shown a strong concordance between POLST form documentation and medical treatment.^{5,6} Prior research has included residents of long-term care nursing facilities where POLST forms are frequently used, but not patients receiving postacute care in the SNF setting.⁶

Because there are no studies describing the use of MOST or POLST forms to document care preferences for patients with HF admitted to SNFs after hospitalization, we accessed data from an HF-disease management clinical trial called SNF-Connect to (1) determine the rate of valid MOST form completion, (2) describe care preferences as documented with MOST forms, (3) explore patient-level characteristics associated with “No CPR,” and (4) evaluate concordance between SNF MOST documentation and health care utilization after SNF admission.

Material and Methods

Study Design, Setting, and Participants

This is a retrospective analysis of MOST forms among SNF-Connect trial participants and is approved by the University of Colorado Multiple Institutional Review Board. The SNF-Connect Trial is a randomized control trial of an HF-disease management program versus usual care.⁷ We used the SNF-Connect trial to evaluate real-world use of MOST forms since

the HF-disease management trial does not affect MOST form use. Patients were admitted to one of 35 SNFs. The parent study outcomes include all-cause rehospitalizations, HF rehospitalizations, and mortality within 60 days from SNF admission. Patients eligible for SNF-Connect had a primary or secondary HF diagnosis at hospital discharge. Exclusion criteria included patients on dialysis, a life expectancy less than 6 months, cognitive impairment without a power of attorney, and residing in a long-term care facility prior to hospitalization.⁷ Of the 378 patients who enrolled in SNF-Connect between July 1, 2014, and May 31, 2016, a total of 8 patients withdrew from the parent study and were excluded from analysis. Investigators were blinded to study group assignment. All patients or authorized representatives for those with dementia provided informed consent.

Data Collection Procedures

Patient characteristics, including demographics and clinical characteristics, were collected by trained SNF-Connect study personnel. Beginning December 2015, research staff retrospectively obtained the MOST forms to determine the rate and validity of MOST form completion. The percentage of MOST forms available from each SNF ranged from 47% to 100%.

Evaluation of MOST Forms

MOST form data were managed using REDCap electronic data capture tools.⁸ Data included presence or absence of a MOST form, SNF where patient was enrolled, signature and date of patient or authorized representative, signature and date of health care provider, and orders for care preferences. The form has 3 sections to address individual care preferences for:

1. Cardiopulmonary resuscitation (CPR)
2. Medical interventions with options for “Full Treatment” including transfer to hospital and intensive care if required; “Selective Treatment,” which permits transfer to hospital but avoids intensive care unit admission; and “Comfort-Focused Treatment,” which avoids transfer to hospital if comfort measures can be met in the current location
3. Artificially administered nutrition with options for long-term/permanent artificial nutrition versus short-term/temporary artificial nutrition versus no artificial nutrition by tube.

The forms were categorized as valid or invalid based on specific requirements for a legally valid Colorado MOST form from the legal statute (Table 1).⁴ A form was deemed valid if all of the requirements for care preferences, signatures, and dates were completed. Additionally, the revised 2015 MOST form required that selection of “Yes CPR” in section A necessitate selection of “Full Treatment” in section B. These criteria were applied across all MOST forms, including 128 original MOST forms and 150 revised MOST forms. Two trained research assistants reviewed 10% of MOST forms to ensure accurate adjudication and entry of care preferences. The original and revised 2015 MOST forms are included as an Appendix.

Evaluation of Health Care Events for Goal-Concordant Care

To determine if patients experienced a health care event (ED visit or hospitalization within 60 days), study personnel contacted patients/family by phone and when applicable, requested ED or hospitalization records electronically. Additionally, the statewide health information exchange system was checked for ED visits or hospitalizations. Records from only the first ED visit or hospitalization were reviewed because care preferences could change across multiple events and transitions. Two trained research assistants reviewed records for whether CPR occurred, for hospital admission, and for intensive care unit–level care during admission. To determine goal-concordant care, we defined 3 potential types of discordant care: (1) patient preference for “No CPR” but received CPR; (2) patient preference for “Comfort-Focused Treatment” but was hospitalized; (3) patient preference for “Selective Interventions” but was admitted to the intensive care unit. Ten percent of records were reviewed by a third team member to ensure reviewer consistency.

Data Analyses

First, sociodemographic and baseline medical characteristics were described. As appropriate, 2-sample *t* tests, chi-square tests, and Fisher exact tests were performed to determine differences in patient groups by (1) presence or absence of a MOST form or (2) validity of a MOST form. Then, we conducted multivariable logistic regressions to determine patient-level characteristics that were associated with choosing “No CPR.” We selected patient-level characteristics as covariates a priori, based on potential clinical relevance or known association with mortality. The covariates chosen were sociodemographic variables (age, gender, race, and education level), an indicator of health care utilization (prior ED visit), and risk related to medical comorbidity. Additionally, any ED visit in the prior year was dummy coded as a health care utilization variable. Nearly all patients had an inpatient hospitalization in the prior year, and thus this variable was not used in regression analyses because of low discriminatory power. Medical comorbidities were classified according to the Charlson Comorbidity Index. The Charlson Comorbidity Index weights 19 conditions to generate a risk score, with a higher total score indicating higher 10-year mortality. For example, AIDS is given 6 points (highest weight) whereas diabetes is given 1 point (lowest weight). The possible score ranges from 0 to 37.⁹ All statistical analyses were performed using R 3.3.1.¹⁰

Results

Completion and Validity of MOST Forms

This study included 370 participants who had a mean age of 78.6 years, 58% were women, and 25% had systolic HF with left ventricular ejection fraction less than 40% (Table 2). The mean Charlson Comorbidity Index was 3.2, with a range of 1 to 10, because all patients had HF. A total of 278 (75%) had a MOST form available in their SNF medical record. There were no significant differences in demographic or clinical characteristics between patients with completed MOST forms and those without.

Of 278 patients with a MOST form, 182 (65%) were valid (Table 3). The most common reasons for an invalid MOST form were missing dates for either patient (52%) or provider

(34%) (Table 3). In most cases, a form was invalid for more than 1 reason, such as missing patient signature, provider signature, or date. Only 1 patient's form was missing documentation of any care preferences, despite the form being signed by patient and health care provider. Twenty forms were invalid because of incongruent care preference selection. On these invalid forms, patients selected "CPR" with either "Comfort-Focused Treatment" (n = 3) or "Selective Treatment" (n = 17). There was no difference in valid versus invalid forms based on which version of MOST form was used.

Care Preference Documentation

Figure 1A shows the care preferences for all patients with valid MOST forms (n = 182), indicating that just more than half of patients selected CPR (53%) or "Full Treatment" (58%). Figure 1B depicts the care preferences among those who selected "No CPR" (n = 85) or CPR (n = 96). One patient did not make a selection for Section A.

Characteristics Associated With Selected Care Preferences

Table 4 shows the multivariable regression results to explore potential associations of patient characteristics and selection of "No CPR." Older women with HF had higher odds of choosing "No CPR." Specifically, for every 5-year increase in age, a patient had a 50% higher odds of choosing "No CPR" ($P < .001$). Women had a 2.33 times higher odds of choosing "No CPR" compared to men ($P < .05$).

Goal-Concordant Care

Patients with both a MOST form and an ED visit or hospitalization within 60 days of SNF admission were evaluated for goal-concordant care. Of 182 patients with a valid MOST form, 66 (36%) had an ED visit or hospitalization. Of these, 63 patients (95%) received goal-concordant care during the event and 3 patients received discordant care based on the SNF MOST form. In all 3 cases, patients selected "Comfort-Focused Treatment," but were admitted to the hospital for more than symptom management. Those without a reported hospitalization in the 60-day follow-up period were not evaluated for care concordance.

Discussion

The rate of MOST form completion among patients with HF in SNF was fairly high (75%), though 35% of these forms were invalid. This suggests that providers had discussions about medical treatment preferences with a majority of these patients. More than one-third of the patients in this study experienced an ED visit or hospitalization within 60 days of SNF admission, emphasizing the importance of these discussions and documentation of patient care preferences in this high-risk population. Of the HF patients with valid MOST forms who experience an ED visit or rehospitalization, 95% received goal-concordant care within 60 days of SNF admission. This study reinforces the American Heart Association's guidelines to integrate care preference discussions into HF treatment and create care plans that reflect patients' wishes.¹¹ It aligns with other POLST studies suggesting that POLST use influences medical treatment in a way that is consistent with documented orders.⁶ Although 3 patients received discordant care, it is possible that patients changed their preferences during the acute medical event. However, it is also possible that the MOST

forms were not available during the care transition and/or a surrogate decision maker was unaware of the MOST form preferences, emphasizing the need for clear conversations and coordinated workflows across settings.

Approximately 35% of the completed MOST forms were invalid, which is similar to an audit for POLST form quality and completion in 13 California nursing homes, which found that 30.4% of POLST forms had at least 1 error or missing item.¹² In our study, MOST forms were most commonly invalid because of logistical problems with form completion, although 16% still had an inappropriate care preference selection. This is higher than other rates of inconsistent treatment preferences, ranging from 5.6% to 7.3%, and represents a need for consistent interdisciplinary training and quality monitoring to ensure that MOST forms are appropriately implemented in subacute rehabilitation.^{12,13}

In our analysis of patient-level characteristics potentially associated with care preference selections, we found that older age and female sex was associated with patient selection of “No CPR.” An association between female sex and more frequent use of DNR orders has been described in other studies, though consistent rationales have not been suggested.^{14–17} In this study, other demographic or clinical characteristics such as race/ethnicity, education, comorbid conditions, and prior ED visits were not associated with selection of “No CPR” on the MOST form. This strongly supports person-centered conversations among a patient, their surrogate decision maker(s), and health care provider teams to ensure that the MOST form is individualized to reflect the patient’s wishes.

This study has several limitations. MOST forms were not able to be collected from all SNFs, and it was unclear if they were truly missing or never done. Thus, it is possible that the completion rate of MOST forms reflects low availability for collection from particular SNFs rather than a low completion rate of MOST forms at the patient-provider level. Given the small sample size and large number of SNFs and health care providers involved, we could not adjust for clustering effects based on these factors. Notably, another study found that facility-level random effects had little influence on patient selection of CPR, full treatment, and artificially administered nutrition.¹⁸ Although the 60-day follow-up enabled assessment of early rehospitalizations, longer and more complete follow-up with claims data and event records to capture multiple care transitions and mortality at 6 months or 1 year is needed.

Conclusion

MOST forms are a useful tool for health care providers to elicit, clarify and document care preferences in patients with HF admitted to SNFs. Even given the high risk for rehospitalization, patients with documented care preferences on MOST forms were highly likely to receive goal-concordant care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

The authors would like to acknowledge the full SNF-Connect research team for their assistance, including Arthur Runkle, M.P.H., Andrea Daddato, M.S., and Blythe Dollar, M.P.H.

This study was supported in full or in part by National Institutes of Health grants 5R01HL113387-024 (PI Boxer), K76AG054782 (PI Lum), a Junior Faculty Career Development Grant from the National Palliative Care Research Center (NPCRC) (PI Lum), and the Colorado Clinical & Translational Sciences Institute (CCTSI) with the Development and Informatics Service Center (DISC) grant support (NIH/NCRR Colorado CTSI Grant Number UL1 RR025780) for use of REDCap-based data management. Dr. Obafemi's work as a preventive medicine resident was supported by Grant Number D33HP25768 from the Health Resources and Services Administration (HRSA). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health, HRSA, or the Department of Veterans Affairs. The sponsors had no role in the design, methods, or preparation of the manuscript.

Trial Registration: Clinicaltrials.gov # NCT01822912

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Fig. 1.

(A) Documentation of care preferences for HF patients using valid SNF MOST forms (n = 182). (B) Comparison of additional care preferences for patients who selected “Yes, CPR” (n = 96) or “No CPR” (n = 85) on SNF MOST forms. One patient did not have a selection in Section A.

Table 1

Requirements for a Legally Valid Colorado MOST Form

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•	Selection of treatment preferences in at least Section A, B, or C
	Congruent treatment preferences—specifically “Yes CPR” requires choosing “Full Treatment” in Section B.
	Signature and date by Patient or surrogate legal decision maker
–	Provider signature and date is required, but “in the absence of a provider signature, the patient selections should be considered as valid, documented patient preferences for treatment.”
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Table 2

Skilled Nursing Facility Patients With Heart Failure, by Whether a MOST Form Was Present or Absent

Characteristics	All (N = 370) n (%)	MOST Form Present (n = 278) n (%)	MOST Form Absent (n = 92) n (%)	P Value
Age, y, mean (SD)	78.6 (9.8)	78.7 (10.1)	78.3 (9.2)	.72 [*]
Female	213 (58)	164 (59)	49 (53)	.34 [*]
Race				
Black	25 (6.8)	20 (7.2)	5 (5.4)	.73 [†]
White	344 (93)	257 (92)	87 (95)	
Asian	1 (0.3)	1 (0.4)	0 (0)	
Ethnicity				
Hispanic or Latino	23 (6.2)	18 (6.3)	5 (5.4)	.91 [‡]
Education level (missing n = 6)				.98 [*]
High school graduate and above	334 (89)	251 (90)	83 (90)	
Residence of origin				.59 [†]
Home	327 (90)	248 (89)	79 (86)	
Assisted living	31 (8.4)	21 (7.6)	10 (11)	
Other	11 (3.0)	9 (3.2)	2 (2.2)	
Left ventricular ejection fraction 40% (missing n = 57)	91 (25)	69 (25)	22 (24)	.97 [*]
Charlson Comorbidity Index	3.2	3.1	3.3	.34 [*]
Medications at baseline, mean (SD) (includes PRN medications)	17 (9.5)	17 (10)	15 (6.7)	.07
ED visit in past 12 mo	135 (37)	104 (37)	31 (34)	.71 [*]
Cognitively intact (BIMS 12)	347 (94)	260 (94)	87 (95)	.91 [‡]

BIMS, Brief Interview for Mental Status; PRN, as needed; SD, standard deviation.

^{*} *t* test.[†] Fisher exact test.[‡] χ^2 test.

Table 3

Description of Valid and Invalid MOST Forms Among SNF Patients With HF (n = 278)

Variable	Valid Form (n = 182) n (%)	Invalid Form (n = 99) n (%)	P Value
Age, y, mean (SD)	79.4 (10.3)	77.4 (9.5)	.12 [*]
Female	108 (59)	56 (57)	.87 [*]
Signature of patient/representative			.15 [†]
Patient	152 (84)	80 (81)	
Legal decision maker	30 (16)	8 (8.1)	
Not signed	0 (0)	11 (11)	
Discipline of signing provider			
Physician	127 (70)	65 (66)	<.01 [‡]
Advanced practice nurse	27 (15)	9 (9.1)	
Physician assistant	28 (15)	11 (11)	
Unable to tell/missing	0 (0)	11 (11)	
Reason for MOST form being invalid [*]			
Lack of any care preference selection	N/A	1 (1.1)	
Incongruent care preference selection		20 (21)	
Missing patient/representative signature		8 (8.6)	
Missing patient/representative date		52 (56)	
Missing health care provider signature		13 (14)	
Missing health care provider date		34 (37)	

N/A, not applicable; SD, standard deviation. All reasons for being invalid were coded.

^{*}
^t *t* test.[†]
^χ χ^2 test.[‡]
^F Fisher exact test.

Table 4

Association of Patient-Level Characteristics With Selection of “No CPR” on Valid MOST Forms (n = 177),
Adjusted Analysis

Patient Characteristics	Selection of “No CPR” OR (95% CI)
Age (5-y intervals)	1.51 [*] (1.26, 1.82)
Women	2.23 [†] (1.12, 4.23)
White race	2.48 (0.82, 7.45)
High school graduate	0.37 (0.12, 1.19)
Charlson Comorbidity Index	1.00 (0.80, 1.26)
ED visit in past 12 mo	1.04 (0.52, 2.09)

CI, confidence interval; OR, odds ratio.

Five valid MOST forms were dropped due to missing CPR preferences or prediction variables.

^{*} $P < .001$.

[†] $P < .05$.