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A Quality Improvement Initiative to Increase Completion and Documentation of Advanced Directives in the ICU at a U.S. Community Teaching Hospital

OBJECTIVES: Advance directives can help guide care in the ICU. As a healthcare quality improvement initiative, we sought to increase the percentage of patients with a healthcare power of attorney and/or practitioner orders for life-sustaining treatment in our ICU and to increase medical resident experience with advance directives through routine screening and documentation of advance directives in the ICU.

DESIGN: Prospective analysis.

SETTING: Urban U.S. community teaching hospital.

PATIENTS: All patients admitted to the ICU from September 2018 to February 2019.

INTERVENTIONS: Internal medicine residents in the ICU received a lecture about advance directives and instructions to screen their patients for advance directives. For willing and decisional patients, residents facilitated the creation of a healthcare power of attorney and/or practitioner orders for life-sustaining treatment. Residents were anonymously surveyed at the beginning and end of the ICU rotation about their experience and level of comfort with healthcare power of attorney and practitioner orders for life-sustaining treatment completion.

MEASUREMENTS AND MAIN RESULTS: Three-hundred seventy-five patients were admitted to the ICU during the study period. Healthcare power of attorney documents were generated by 34% of all ICU patients without a prior healthcare power of attorney, increased from a baseline rate of 10% ($p < 0.001$). The number of practitioner orders for life-sustaining treatment documents for patients with code status of “no cardiopulmonary resuscitation” did not increase significantly. The percentage of residents who facilitated completion of a healthcare power of attorney document increased significantly from 56% to 100% ($p < 0.001$), whereas their practitioner orders for life-sustaining treatment experience did not change significantly by the end of their ICU rotation. On a Likert scale of 0–10, mean resident comfort increased significantly both with healthcare power of attorney documentation, rising from 6.14 to 8.84 ($p = 0.005$) and with practitioner orders for life-sustaining treatment form completion, increasing from 6.00 to 7.84 ($p = 0.008$).

CONCLUSIONS: Training ICU medical residents to routinely screen for and facilitate completion of advance directives significantly increased the percentage of ICU patients with a healthcare power of attorney and significantly improved medical resident comfort with healthcare power of

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attorney and practitioner orders for life-sustaining treatment form completion.

KEY WORDS: advance directive; advance care planning; Healthcare Power of Attorney; intensive care; medical residents; Practitioner Orders for Life-Sustaining Treatment

Advance directives (AD) are documents that allow patients to express their medical treatment preferences. Two commonly used ADs in Illinois are the healthcare power of attorney (HCPOA) and practitioner orders for life-sustaining treatment (POLST). Through the HCPOA, patients designate a medical decision-maker to act on their behalf in the event they lose decision-making capacity. The POLST, a medical order intended to guide out-of-hospital care, documents patients' preferences about aggressive medical interventions such as cardiopulmonary resuscitation (CPR) and mechanical ventilation (1).

Although several medical groups support documentation of healthcare preferences (2–4) and some public health experts state that completion of ADs should be a “routine part of patient encounters and used as a metric of quality care” (5), a study from 2014 revealed that approximately only one third of U.S. adults had completed an AD (6). Older adults are more likely to have an AD, and rates of AD completion may be increasing among older and sicker patients. In a study of patients 60 years old and older, the proportion of decedents with an AD increased from 47% to 71% between 2000 and 2010 (7).

There is a growing body of evidence in the medical literature that patients with ADs are more likely to receive medical care concordant with their wishes and are less likely to die in the hospital than patients without ADs (7–13). The presence of ADs also appears to improve family satisfaction with the healthcare provided and decreases family stress, depression, and anxiety (12). Finally, the completion of ADs may decrease healthcare costs at the end of life (8, 14, 15).

The Patient Self Determination Act of 1990 requires all healthcare institutions receiving Medicare or Medicaid funds to inform patients of their right to complete an AD and to document their healthcare preferences in the medical record (16). This bill does not, however, state who specifically among the medical staff should carry out this task. Furthermore, there is no standardized method for documenting patient

treatment preferences. A review from 2017 revealed that both medical professionals and laypeople have incomplete and inconsistent knowledge about AD documentation (17). Furthermore, several studies have shown that the processes of documenting and accessing AD have been problematic, although the electronic medical record (EMR) may provide an opportunity to improve the storage of ADs and facilitate access to them (18, 19).

Although it has been suggested that education regarding ADs should be part of medical resident cultural competency training (5), a paucity of studies exists in the medical literature on how to integrate AD education into the curriculum. Several medical training programs have developed initiatives to increase competency in advance care planning (ACP) in the outpatient setting with good results (20, 21). Although AD education anywhere along the continuum of healthcare is valuable, AD competency training in the ICU provides the opportunity to impact the care of critically ill patients, for whom these documents are potentially the most relevant.

This study addressed whether training medical residents to routinely screen for ADs during ICU teaching rounds could increase the percentage of ICU patients with HCPOA and/or POLST documents. We also sought to standardize the documentation of ADs in the EMR and to increase medical resident experience and comfort with completing ADs.

The transtheoretical model (TTM) was used to guide this study (22). TTM provides a framework for conceptualizing ACP as a process of health behavior change and designing interventions that address ACP engagement. Targeting the action and maintenance stages of behavior change, medical residents intervened by supporting patients in ICU to engage in the process of ACP.

MATERIALS AND METHODS

Setting

This study took place in the medical-surgical ICU of a 338 bed U.S. urban community teaching hospital. During this study period, the 20 bed ICU was staffed by one full-time and two part-time board-certified critical care physicians, a team of five to seven internal medicine residents, and an average of one nurse per two ICU patients.

From September 2018 to February 2019, at the start of each month-long ICU rotation, an intensivist (K.L.W.) and a palliative care physician (M.J.T.) jointly facilitated a small group presentation to the medical residents in the ICU about HCPOA and POLST documents. Education was provided on how to assess a patient's decision-making capacity, assess the medical treatment preferences, and appropriately facilitate the completion of HCPOA and POLST documents. The ICU residents were also provided EMR "Advance Care Planning" templates to accurately record patient treatment preferences from newly obtained ADs.

Every patient admitted to the ICU from September 2018 to February 2019 was screened during teaching rounds for the presence of a HCPOA or POLST (**Supplementary Material**, Rounding Protocol, <http://links.lww.com/CCX/A601>). If a patient with decision-making capacity did not have a formally designated decision-maker, an ICU resident recommended establishing a HCPOA and provided the HCPOA form to be completed if the patient agreed. If a patient expressed a preference for "no-CPR" but did not have a POLST, an ICU resident assisted in the completion of a POLST document, with the consent of the patient or their HCPOA. The original paper copy of the AD was given to the patient, and extra copies were provided to their proxy decision-maker(s), if desired. The ICU medical resident documented the creation of an AD in the EMR using the "Advance Care Planning" template (**Appendix**, <http://journals.lww.com/ccejournal>). A copy of the AD was also sent to the medical records department to be scanned into the EMR.

Internal medicine residents were surveyed anonymously at the beginning and the end of their month-long ICU rotation about their experience and comfort with helping patients complete HCPOA and POLST documents.

Data Collection

From September 2018 to February 2019, we prospectively tracked the number of patients who created ADs during their ICU stay. Data from the EMR were stored in a password-protected computer by two residents (T.A., T.G.V.) and independently checked by the intensivist (K.L.W.) regarding the presence of prior HCPOA and POLST documents, the patient's code status, and newly created HCPOA and POLST forms. Reasons that HCPOA were not completed were documented as

follows: patient already had a HCPOA, patient did not have decisional capacity to complete a HCPOA, patient declined the recommendation to complete a HCPOA, patient had no one to designate as a HCPOA (unbefriended), patient was in the ICU less than or equal to 2 days, and HCPOA completion was missed by ICU team. For POLST form noncompletion, the following reasons were documented: patient already had a POLST form, patient died during hospitalization, patient did not have decisional capacity or a designated decision-maker, patient was in the ICU less than or equal to 2 days, and POLST completion was missed by ICU team.

To obtain our ICU's baseline preintervention percentage of patients with HCPOA and POLST documents, an EMR chart review was performed by two residents (T.A., T.G.V.) and independently checked by the intensivist (K.L.W.) of all patients admitted to the ICU one year prior, during the 6-month period between October 2017 and March 2018.

Ethical Approval

The Institutional Review Board (IRB) of AMITA Health St. Joseph Hospital reviewed the research protocol and waived the need for informed consent (IRB Protocol number 2018-15).

Statistical Analysis

Normally distributed variables were expressed as mean and SD; nonnormal variables were presented as median and interquartile range. The *z* score for two population proportions was used to compare the number of HCPOA and POLST forms obtained from baseline to intervention period and the percentage of residents reporting having completed HCPOA and POLST forms before and after intervention. The Mann-Whitney *U* test was used to assess the mean difference in resident comfort with the completion of HCPOA and POLST forms between the pre- and postintervention periods. Statistical analysis was performed using SPSS, Version 20 (IBM Corp, Armonk, NY).

RESULTS

From September 2018 to February 2019, 375 patients were admitted to the ICU, and 34 medical residents completed a month-long rotation in the ICU. The average age, sex, race/ethnicity, and APACHE II scores of

TABLE 1.
Patient Characteristics

Characteristics	Pre Intervention (n = 529)	Intervention (n = 375)
Age, yr, mean (sd)	65 (18.5)	66 (18.6)
Male sex, n (%)	281 (53)	192 (51)
Race/ethnicity, n (%)		
White	328 (62)	238 (63)
Black	112 (21)	93 (25)
Hispanic	50 (9)	31 (8)
Asian	23 (4)	12 (3)
Other	16 (3)	1 (0)
Acute Physiology and Chronic Health Evaluation II score, median (interquartile range)	11.38 (6–15)	13.48 (8–18)

the ICU patients were well matched between the intervention and the preintervention time periods (**Table 1**). During the intervention period, HCPOA documents were created by 129 patients, representing 34% of all ICU patients, up from a preintervention completion rate of 10% ($p < 0.001$) (**Table 2**). The total percentage of ICU patients with a HCPOA increased from a baseline rate of 23% pre intervention to 56% in the intervention group ($p < 0.001$). Of the 246 ICU patients who did not complete a HCPOA, 94 (38%) had an ICU

stay of less than or equal to 2 days, 38 (15%) lacked decision-making capacity, 21 (9%) declined to complete a HCPOA, and three patients (1%) were unbefriended, reporting having no one available to serve as HCPOA (**Table 3**). Only nine of decisional, consenting patients (4%) without a prior HCPOA and an ICU stay greater than 2 days failed to complete a HCPOA document.

The number of ICU patients with a “no-CPR” code status who completed a POLST during the intervention period was 29%, which did not significantly differ from a preintervention baseline of 27% (**Table 2**). During the intervention period, of the 75 patients admitted to the ICU with a code status preference for “no-CPR,” 20 (27%) already had a POLST. Of the 55 patients with no prior POLST during the intervention period, 22 patients (40%) completed a POLST form in the ICU, 16 (29%) died in the hospital without completing a POLST, eight (15%) were in the ICU less than or equal to 2 days, and three (5%) had no available decision-maker. Only six patients (11%) with a no-CPR code status and an ICU stay of greater than 2 days did not complete a POLST form in the ICU (**Table 4**).

Based on anonymous surveys including all 34 residents at the beginning and end of each month-long ICU rotation during the 6 month intervention period, the number of residents who facilitated the completion of a HCPOA document increased significantly from 19 (56%) at the start of the ICU rotation to 34 (100%) at the end ($p < 0.001$) (**Fig. 1**). However, the number of ICU residents who reported completing a POLST did not significantly increase from baseline, rising from 21 (62%) to 25 (74%) ($p = 0.3$). Reporting on a Likert scale ranging

TABLE 2.
Patients With Advance Directives in Preintervention and Intervention Groups

Characteristics	Pre Intervention (n = 529)	Intervention (n = 375)	p
HCPOA prior to ICU admission, n (%)	69 (13)	81 (22)	< 0.001
HCPOA created in ICU, n (%)	51 (10)	129 (34)	< 0.001
Total number of patients with HCPOA, n (%)	120 (23)	210 (56)	< 0.001
Patients with do not resuscitate code status, n (%)	135 (26)	75 (20)	0.04
POLST prior to ICU admission, n (%)	28/135 (21)	20/75 (27)	0.57
POLST created in ICU, n (%)	37/135 (27)	22/75 (29)	0.76
Total number of patients with POLST, n (%)	65/135 (48)	42/75 (56)	0.31

HCPOA = healthcare power of attorney, POLST = practitioner orders for life-sustaining treatment.

TABLE 3.
Patient Characteristics and Healthcare Power of Attorney Outcomes (Intervention Group)

Outcomes	Completed HCPOA	Did Not Complete HCPOA					
		In ICU \leq 2 d	Prior HCPOA	Not Decisional	Declined	Missed	Unbefriended
Rationale	Consented						
Number of patients	129	94	81	38	21	9	3
Male, <i>n</i>	60	51	36	25	10	7	3
Female, <i>n</i>	69	43	45	13	11	2	0
Age, yr, mean	64	61	77	68	65	63	68
Race/ethnicity, <i>n</i>							
White	83	59	50	24	14	6	2
Black	30	23	24	10	4	1	1
Hispanic	10	11	4	3	2	1	0
Asian	5	1	3	1	1	1	0
Other	1	0	0	0	0	0	0

HCPOA = healthcare power of attorney.

TABLE 4.
Characteristics and POLST Outcomes of Patients with “Do Not Resuscitate” Code Status (Intervention Group)

Outcomes	Completed POLST	Did Not Complete POLST				
		Prior POLST	Died in Hospital	In ICU \leq 2 d	Missed	No Decision-Maker
Variables	Consented					
Number of patients	22	20	16	8	6	3
Male, <i>n</i>	9	5	7	4	3	2
Female, <i>n</i>	13	15	9	4	3	1
Age, yr, mean	81	84	76	78	86	85
Race/ethnicity, <i>n</i>						
White	18	12	10	7	3	2
Black	3	8	3	1	3	0
Hispanic	1	0	2	0	0	1
Asian	0	0	1	0	0	0
Other	0	0	0	0	0	0

POLST = practitioner orders for life-sustaining treatment.

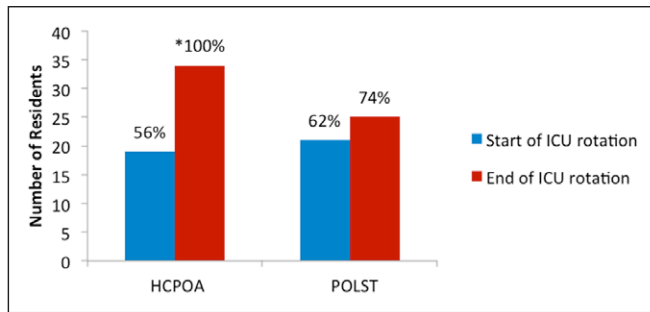


Figure 1. Medical resident completion of an advance directive. * $p < 0.001$. HCPOA = healthcare power of attorney, POLST = practitioner orders for life-sustaining treatment.

from 0 ("very uncomfortable") to 10 ("very comfortable"), resident mean comfort level with AD completion increased significantly both for HCPOA and POLST forms, rising from 6.14 to 8.84 ($p = 0.005$) for HCPOA and from 6.0 to 7.93 ($p = 0.008$) for POLST (Fig. 2).

DISCUSSION

The majority of patients admitted to the ICU in our urban community teaching hospital between September 2018 and February 2019 did not have preexisting ADs: 78% did not have a HCPOA document, and only 27% of patients with a "no CPR" code status had a POLST form. Our intervention resulted in a statistically significant increase in the percentage of patients in the ICU with a designated HCPOA compared with a baseline level from October 2017 to March 2018. However, POLST documentation during the intervention period did not increase significantly for ICU patients not wishing to receive CPR. This discrepancy can be partially explained by the fact that POLST documents are generally not pursued for patients with a "no-CPR" code status expected to die during their hospitalization as the POLST is primarily intended to guide care provided by first responders in the outpatient setting.

This study demonstrated a statistically significant increase in medical resident comfort with completing both HCPOA and POLST forms. Whether this experience increases the likelihood that these physicians will recommend ADs for their future patients is an area of interest for further research.

This study's success in increasing the percentage of ICU patients with HCPOA documents is likely due to several factors. First, at the start of each ICU rotation, the residents received formal training on ADs and how to assess a patient's decision-making capacity.

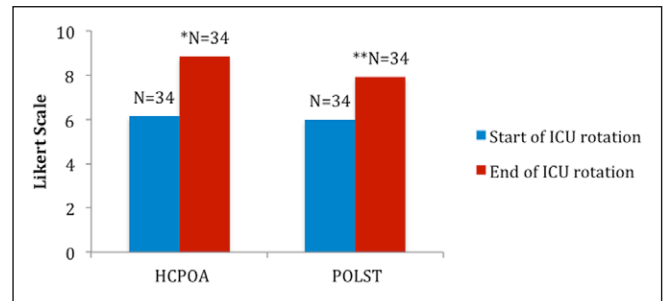


Figure 2. Medical resident comfort level with advance directive completion. * $p = 0.005$. ** $p = 0.008$. HCPOA = healthcare power of attorney, POLST = practitioner orders for life-sustaining treatment.

This training likely not only increased the medical residents' comfort with ADs but also conveyed an explicit message about the importance of ADs for critically ill patients. Second, integration of this intervention into ICU teaching rounds strengthened the expectation that medical residents were responsible for screening ICU patients for ADs (Supplementary Material, Rounding Protocol, <http://links.lww.com/CCX/A601>). Third, a physician recommendation to complete an AD may have reinforced the importance of these documents to patients and increased their willingness to complete an AD. Another strength of our intervention, although not analyzed in this study, included the documentation of AD completion in the EMR as an "Advance Care Planning" note. Documentation of ADs in the EMR ensures that patient care preferences will be more accessible to clinicians providing future care.

There are several limitations of this study. First, it is a single-center nonrandomized study at an urban U.S. community teaching hospital, which limits its generalizability. Second, although the patients from the preintervention group were well matched to the intervention group by age, sex, race, and APACHE II scores, there were fewer patients admitted to the ICU during the intervention period, which may have affected the residents' ability to obtain ADs. Third, this study's sustainability depends upon incorporation of both a monthly AD training session for residents and AD screening on ICU rounds. Fourth, although all 34 ICU residents completed the anonymous surveys at the beginning and end of their ICU rotations, these surveys were not paired to each resident, which limits insight into how scores changed on an individual level. Fifth, the survey responses may have been subject to both recall and social desirability bias. Sixth, increased comfort with completing a task does not necessarily correlate with increased

task competence. Seventh, this study did not address the duration of the effect that the AD training had on medical resident practice patterns. Eighth, this intervention did not measure how the creation of an AD affected future clinical care received by these patients and whether the goals of care expressed in the AD were respected.

The process by which patients discuss their goals of care with their proxy decision-makers is critical to ensure a HCPOA can exercise appropriate substituted judgment when the need arises (23, 24). Other interventions, such as structured formats to guide discussions and systems to trigger early goals of care discussions, can help facilitate best practices in communication and produce personalized healthcare plans for patients (25–27). As this quality improvement project aimed specifically to increase ADs, but not to address goals of care or code status, the downstream clinical effects of this intervention would be a target for future study.

CONCLUSIONS

In a prospective study performed at an urban U.S. community teaching hospital, more than three quarters of patients admitted to the ICU did not have preexisting ADs. Our study demonstrated that many of these patients had both the decision-making capacity and desire to complete ADs when recommended to do so by an ICU resident physician. Our results showed that resident training and routine screening for ADs during ICU teaching rounds significantly increased the percentage of ICU patients with a newly created HCPOA and resulted in a significant improvement in resident comfort with completing HCPOA and POLST forms.

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