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Evaluating an Intervention to Improve Communication Between Oncology Clinicians and Patients With Life-Limiting Cancer
A Cluster Randomized Clinical Trial of the Serious Illness Care Program

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IMPORTANCE Earlier clinician-patient conversations about patients' values, goals, and preferences in serious illness (ie, *serious illness conversations*) are associated with better outcomes but occur inconsistently in cancer care.

OBJECTIVE To evaluate the efficacy of a communication quality-improvement intervention in improving the occurrence, timing, quality, and accessibility of documented serious illness conversations between oncology clinicians and patients with advanced cancer.

DESIGN, SETTING, PARTICIPANTS This cluster randomized clinical trial in outpatient oncology was conducted at the Dana-Farber Cancer Institute and included physicians, advanced-practice clinicians, and patients with cancer who were at high risk of death.

MAIN OUTCOMES AND MEASURES The primary outcomes (goal-concordant care and peacefulness at the end of life) are published elsewhere. Secondary outcomes are reported herein, including (1) documentation of at least 1 serious illness conversation before death, (2) timing of the initial conversation before death, (3) quality of conversations, and (4) their accessibility in the electronic medical record (EMR).

RESULTS We enrolled 91 clinicians (48 intervention, 43 control) and 278 patients (134 intervention, 144 control). Of enrolled patients, 58% died during the study (n=161); mean age was 62.3 years (95% CI, 58.9-65.6 years); 55% were women (n=88). These patients were cared for by 76 of the 91 enrolled clinicians (37 intervention, 39 control); years in practice, 11.5 (95% CI, 9.2-13.8); 57% female (n=43). Medical record review after patients' death demonstrated that a significantly higher proportion of intervention patients had a documented discussion compared with controls (96% vs 79%, *P* = .005) and intervention conversations occurred a median of 2.4 months earlier (median, 143 days vs 71 days, *P* < .001). Conversation documentation for intervention patients was significantly more comprehensive and patient centered, with a greater focus on values or goals (89% vs 44%, *P* < .001), prognosis or illness understanding (91% vs 48%, *P* < .001), and life-sustaining treatment preferences (63% vs 32%, *P* = .004). Documentation about end-of-life care planning did not differ between arms (80% intervention vs 68% control, *P* = .08). Significantly more intervention patients had documentation that was accessible in the EMR (61% vs 11%, *P* < .001).

CONCLUSIONS AND RELEVANCE This communication quality-improvement intervention resulted in more, earlier, better, and more accessible serious illness conversations documented in the EMR. To our knowledge, this is the first such study to demonstrate improvement in all 4 of these outcomes.

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Absent, late, and poor-quality clinician-patient communication in serious illness contributes to avoidable suffering for patients and families and overly aggressive, lower-quality care that may not align with patient goals.[1-5]

Although up to 87% of patients with terminal cancer have documentation of a discussion with clinicians about their goals by the end of their lives, these discussions begin, on average, 1 month before death, and the majority take place in acute care settings with clinicians who are not the treating oncologist.[6] In broader seriously ill populations, the proportion of patients or surrogates who report having such conversations varies significantly (18%-64%) but is generally much lower than rates of documented discussions.[1,6,7] In an increasingly fragmented health care system dependent on the electronic medical record (EMR) for communication among clinicians, documentation of these discussions is often inadequate, inconsistent, and inaccessible.[8,9] Furthermore, researchers and national consensus bodies recommend making these conversations part of routine care for seriously ill patients and broadening the focus of these discussions from discrete decisions about life-prolonging procedures to conversations that address patients' broader values, goals, and informed preferences, or *serious illness conversations*.[10-14] There is a need for more patients to have serious illness conversations with clinicians; there is also a need for earlier initiation of these conversations, better discussions that address more comprehensive and patient-centered domains, and more accessible conversations that are appropriately documented in the electronic medical record.

Preparing clinicians who care for seriously ill patients to have timely, high-quality serious illness conversations requires addressing numerous barriers: inadequate clinician training in communication-skills, clinician time constraints, patient anxiety, clinician uncertainties about appropriate conversation timing or patients' readiness to discuss these issues, ambiguous responsibility among multiple clinicians for holding a conversation, and inadequate systems to support clinicians in eliciting and documenting patient goals.[10,15-20] Numerous interventions have attempted to improve these conversations and associated patient outcomes, and results have been mixed.[21-29] While many interventions focus exclusively on clinician training and education, there is insufficient evidence that training alone leads to improvements in clinician conversation practices or patient-level outcomes.[30,31] Therefore, we need comprehensive system-level solutions that address the entire range of barriers to support integration of serious illness communication into clinical practice.

We designed a communication quality-improvement intervention, the Serious Illness Care Program (SICP), to improve serious illness conversations. The intervention was extensively pretested with clinicians and patients[32]; each intervention component addressed 1 or more of the barriers to these discussions (**Table 1**).[33] We tested the effect of the intervention with oncology clinicians and their patients in a cluster randomized clinical trial at Dana-Farber Cancer Institute. The study's primary outcomes (goal-concordant care and peacefulness at the end of life) and secondary patient outcomes (anxiety, depression, therapeutic alliance, and sur-

Key Points

Question Does a communication quality-improvement intervention improve the occurrence, timing, quality, and electronic medical record accessibility of documented conversations about values, goals, and preferences (ie, *serious illness conversations*) between oncology clinicians and patients with advanced cancer?

Findings In this cluster randomized clinical trial of 91 clinicians and 278 patients, the intervention resulted in more, earlier, and better serious illness conversations with clinicians for patients with advanced cancer, in addition to more accessible documentation of patient goals, in the face of life-limiting illness.

Meaning A communication quality-improvement intervention that provides clinical tools, clinician training, and system changes can bring about meaningful improvement in timely, comprehensive serious illness conversations between patients and primary oncology clinicians.

vival) are reported elsewhere.[34] The goal of this analysis was to evaluate the effect of the intervention on secondary conversation outcomes, including the occurrence, timing, quality, and documentation accessibility of oncology clinician-led serious illness conversations. We hypothesized that the results of this intervention would be (1) that a higher proportion of oncology patients would have at least 1 documented conversation before death, (2) that the conversations would start earlier in the illness course, and that conversations would be (3) more comprehensive and (4) more accessible in the EHR.

Methods

The study was conducted at the Dana-Farber Cancer Institute (DFCI), a large National Cancer Institute–designated cancer center, and 2 affiliated satellite clinics. It was approved by the DFCI institutional review board and registered, and all participants provided written informed consent. The trial protocol is available in Supplement 1.

Intervention Description

The communication quality-improvement intervention included clinical tools, clinician training, and system changes (Table 1).[32] The primary clinician tool was a structured communication guide called the Serious Illness Conversation Guide (SICG). Patient tools included a preconversation letter given to the patient at study enrollment, which introduced the SICG, and a "Family Guide," outlining an approach for continuing the conversation with their family after the patient-clinician discussion. The clinician training included a 2.5-hour, skills-based training session on the SICG led by palliative care faculty. System changes included the following systematic components: (1) clinicians were asked the "surprise question," "would you be surprised if this patient died in the next year?"[33]; (2) clinicians were sent email reminders and given the SICG by study staff the day before an outpatient visit; (3) an accessible, structured, EMR documentation template mirroring the SICG was provided, and clinicians were trained on its

Table 1. Components of SICP Intervention to Improve Clinician-Patient Serious Illness Communication

Intervention Component	Description	Communication Barrier Addressed	Improvement Aim
Clinical tools			
SICG	The SICG was used by intervention clinicians to guide the conversation. SICG is a structured communication guide that provides clinicians with psychologically informed language to assess illness understanding and patient information preferences; share prognosis according to patient preferences; explore patient values, goals, and care preferences; and make a recommendation based on patient priorities.	Clinicians unsure of what to say in these discussions	Better
Patient and family materials	Intervention patients were prepared ahead of the conversation with a written letter; patients were also given a Family Guide after a SICG conversation to support follow-up discussions with their family members.	Inadequacies in introducing anxiety-provoking topics gently to patients and their family members	Better
Clinician training			
Skills-based training program of 2.5 hours	Structured training was delivered to intervention clinicians with standardized elements and individualized observation and feedback delivered by palliative care faculty.	Lack of clinician training in serious illness communication	Better
System changes			
Patient identification using the "surprise question"[a]	The surprise question "Would you be surprised if this patient died in the next year?"[33] was applied at regular intervals by oncology clinicians to lists of their patients.	Uncertainties about timing; lack of a formal system to elicit and document patient goals	More, earlier
Reminders	Email reminders were provided to intervention clinicians to initiate conversations using the SICG during routine care visits in the outpatient setting.	Uncertainties about timing; lack of a formal system to elicit and document patient goals	More, earlier
SICG documentation template in an accessible advance care planning module in the EMR	A novel, structured, accessible template in the electronic medical record was developed to document serious illness conversations, and intervention clinicians were trained to use it.	Inadequacies and inconsistencies in documentation about patient goals	Better, greater accessibility
Coaching on use of the SICG	Palliative care faculty offered coaching to intervention clinicians on use of the SICG by phone, email, or in person.	Lack of clinician training and support in serious illness communication	More, earlier, better

Abbreviations: EMR, electronic medical record; SICG, Serious Illness Conversation Guide; SICP, Serious Illness Care Program.

[a] The surprise question was used by both intervention and control clinicians to identify patients eligible for the trial.

use; and (4) in-person, email-based, or telephonic clinician coaching on the SICG was provided by palliative care faculty. The quality-improvement elements of these intervention components are described in more detail elsewhere.[32]

Control clinicians provided usual care and did not receive any intervention components, except for regular identification of eligible patients using the surprise question. The SICG template was available in an EMR advance-care planning module. Although all clinicians at DFCI were made aware of the module prior to the study, control clinicians were not trained to use the SICG template. Control patients received no supporting documents.

All clinicians received a $150 restaurant gift card for participation. Patients and caregivers did not receive compensation for participation.

Trial Design
We tested the SICP in a cluster randomized clinical trial from September 2012 to June 2016. Clinicians were randomized in clusters at enrollment to intervention or control arms, as elsewhere reported (**Figure 1**).[34] Clusters were units of clinicians within a disease center (eg, breast oncology), typically including 1 nurse practitioner or physician's assistant and 2 or 3 physicians, although the numbers varied. Patients, but not clinicians, were blinded to study arm.

Participants and Eligibility Criteria
All physicians, nurse practitioners, and physician's assistants from the selected sites were eligible to participate in the study; clinicians from 10 disease centers and 2 satellites enrolled. Both intervention and control clinicians identified patients (18 years or older, receiving ongoing oncology care at the center) for eligibility using the surprise question: "Would you be surprised if this patient died in the next year?"[33] Patients for whom the response was "no, I would not be surprised" were eligible for the study. We excluded patients who were not English speaking, had cognitive impairment, or were unable to identify a caregiver to participate.[32] For this analysis, patient participants who died within 2 years of study enrollment were eligible for inclusion.

Sample Size and Participant Characteristics
We powered the study based on its primary outcomes, goal-concordant care and peacefulness at the end of life, which are reported elsewhere.[34] At baseline, we collected clinician and patient demographic characteristics for both study arms.

Outcomes
We obtained the secondary outcomes reported herein from EMR review for patients who had died, including (1) proportion of patients with at least 1 documented serious illness

Figure 1. Participant Enrollment and Randomization Flowchart for the Secondary Outcomes of the Serious Illness Care Program Cluster Randomized Clinical Trial
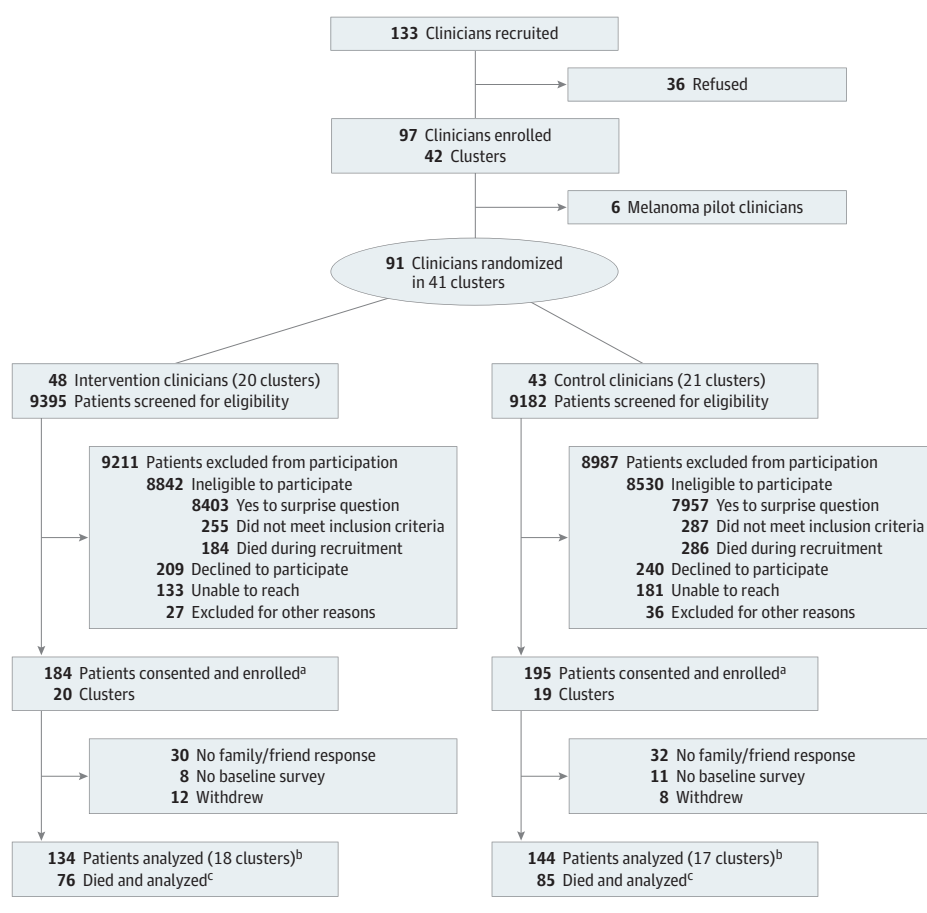
[a] We calculated patient participation rate (46%) as the number of patients consented and enrolled divided by the total number of patients invited to participate.

[b] The number of clusters decreased from 41 (number of clinician clusters) to 35 (number of clusters for analyzable patients) because some clinician clusters either enrolled no patients or their patients' data were not able to be analyzed.

[c] Unlike the primary outcomes analysis reported elsewhere,[34] these secondary documentation outcomes were not dependent on return of patient surveys, so the denominator includes all patients who died within 24 months of enrollment.

conversation before death; (2) median timing of the first documented serious illness conversation before death; (3) quality of documented serious illness conversations; and (4) proportion of patients with documentation of a serious illness conversation in an accessible EMR location.

Serious Illness Conversation Documentation Review Methodology
For patients who died during the study period, study staff blinded to study arm conducted a retrospective record review of ambulatory oncology EMR records (incorporating all progress notes and a structured module designed to capture all advance care planning documentation, including the SICG template). A multidisciplinary team, with expertise in palliative care and psychiatry, iteratively developed and refined through pilot testing a thematic codebook to facilitate record abstraction and text coding. Using this codebook, a trained, blinded researcher abstracted all instances in the EMR of serious illness conversations that addressed at least 1 of 4 domains: (1) values or goals; (2) prognosis or illness understanding; (3) end-of-life care planning; or (4) life-sustaining treatment preferences. A second trained, blinded researcher independently abstracted and double-coded 10% of patient records to verify consistency across coders, with 98% agreement on all abstracted elements. For each patient, the reviewer recorded

absence or presence of at least 1 serious illness conversation; date of each conversation; retrieval location (progress note vs structured module); and content of each conversation for coding.

Serious Illness Conversation Documentation Outcomes
To measure the occurrence of serious illness communication, we noted the presence or absence of at least 1 documented serious illness conversation before death for each patient. To measure the timing, we calculated the time (in days) from the initial conversation to death for patients who had at least 1 serious illness conversation. To measure the quality of serious illness conversations, we coded all abstracted notes for each patient for the presence or absence of each of the 4 conversation domains and reported these data in 2 ways: (1) mean number of domains per patient; and (2) presence or absence of each of the 4 domains per patient. We also recorded the total number of notes per patient. To measure accessibility, we recorded the presence or absence of serious illness conversation documentation in the EMR structured advance care planning module (vs progress note) for patients who had at least 1 conversation. Accessibility was calculated for the subset of patients who died before June 1, 2015, because there was an institutionwide EMR change after that date, and the new EMR

did not have a working module until after the study period ended.

Statistical Analysis

We performed statistical analyses with SAS software, version 9.4 (SAS Institute Inc). We used proportions to describe results for categorical variables and means or medians for continuous variables. We used intention-to-treat for all analyses and accounted for clustering of patients within clinician teams.

Clinician and Patient Characteristics

When comparing baseline clinician and patient characteristics across arms, we used robust generalized estimating equations (GEE)[35] Wald tests clustering by clinician team, with arm as a dichotomous covariate, and linear and logistic link functions for continuous and dichotomous characteristics, respectively.

Serious Illness Conversation Documentation Outcomes

We analyzed differences between arms in the proportion of patients who had at least 1 documented serious illness conversation before death using robust GEE Wald tests to evaluate occurrence of conversations. We used a log-rank test to compare the distribution of time from randomization until initial documented conversation between intervention and control arms. For quality of documented serious illness conversations, we coded the content into thematic domains using NVivo, version 10.0 (QSR International). Between arms, we then compared the mean number of conversations and domains per patient using robust GEE t tests. We also compared the proportion of patients with documentation within each of the 4 domains between arms using robust GEE Wald tests.[36] These 4 outcomes were considered equally important, and we used the Holm-Bonferroni method to adjust for multiple testing and to ensure an overall type I error of 5% when comparing the 4 outcomes across arms. For accessibility, we analyzed differences between arms in the proportion of patients who had documentation in the structured EMR module using robust GEE χ^2 tests.

Results

Clinician and Patient Characteristics

We enrolled and randomized 91 oncology clinicians; 76 oncology clinicians had at least 1 enrolled patient who died during the study period and were included in this analysis. Of 278 patients enrolled, 161 died during the study period and were included in this analysis. There were no significant differences in baseline characteristics of clinicians (eTable 1 in Supplement 2) or patients (eTable 2 in Supplement 2) across study arms.

Serious Illness Conversation Documentation Measures

We conducted EMR reviews of all 161 patients who died during the study period, and all absolute numbers as well as the following percentages are reported in **Table 2**: Significantly more intervention patients than controls (96% vs 79%,

$P = .005$) had at least 1 documented serious illness conversation before death. The timing of the first conversation was significantly earlier in the intervention group (median 143 days before death; interquartile range [IQR], 71-325 days) than in the control group (median 71 days; IQR, 33-166 days) ($P < .001$). Significantly more intervention patients had a documented discussion about values or goals (89% vs 44%, $P < .001$), prognosis or illness understanding (91% vs 48%, $P < .001$), and life-sustaining treatment preferences (63% vs 32%, $P = .004$). Documentation of discussions about end-of-life care planning (80% intervention vs 68% control, $P = .08$) did not differ significantly between arms. Conversations for intervention patients also included significantly more domains on average (mean 3.2 domains vs 1.9 domains, $P < .001$). There were significantly more conversations per patient in the intervention group than in the control group (mean 3.1 conversations per patient vs 2.1 conversations per patient, $P = .02$). For the subset of patients who died before June 1, 2015 (when there was an institutionwide EMR change), and had at least 1 documented serious illness conversation (n = 111; 57 intervention and 54 control), significantly more intervention patients than controls had a discussion documented in the accessible structured EMR module (61% vs 11%, $P < .001$).

Discussion

This cluster randomized clinical trial demonstrates that a communication quality-improvement intervention resulted in significant improvements in 4 key conversation indicators, including more, earlier, better, and more accessible oncology clinician–led serious illness conversations. The SICP resulted in nearly universal access to such conversations, with 96% of intervention patients having at least 1 documented conversation before death. Conversations also occurred a median of 2.4 months earlier in the intervention arm than in the control arm, and the documentation of the conversations with intervention patients was more accessible in the EMR and contained significantly more comprehensive and broader information about patients' values, goals, and preferences. While several interventions have been shown to increase goals-of-care communication and documentation or patient-reported quality,[22-24,26,29] to our knowledge, no other study has demonstrated an effect on all 4 of these conversation indicators.

The significant increase in conversations in the intervention arm suggests that successfully integrating these conversations into a typical oncology practice is feasible. A structured conversation guide and matching EMR documentation tool, reminder process, and clinician training and coaching appear to have addressed known barriers to serious illness communication, including clinicians' lack of communication training, time constraints, and cumbersome (or absent) systems for having and documenting conversations.[17,18] Improving the documentation of conversations with a structured EMR template also provides easier access to this critical information, an issue increasingly recognized as essential for patient safety.[9,37] If clinicians, especially those clinicians who are unfamiliar with the patient and facing an emergency, cannot easily

Table 2. Serious Illness Conversation Documentation Outcomes

Outcome	Intervention (n = 76)	Control (n = 85)	P Value
Patients with at least 1 documented serious illness conversation, No. (%)[a]	73 (96)	67 (79)	.005
Patients with documentation of a discussion about values or goals, No. (%)	68 (89)	37 (44)	<.001
Illustrative quotes			
"Since spending time with her family is a priority she does not want treatment that would confine her to the hospital for the majority of her time. She prefers to be home if treatment is not likely to extend her life."			
"Our goal is to give him as much time as possible while he feels strong and energetic. He continues to want to spend as much time on his boat as possible and he definitely wants to maintain his teaching schedule."			
Patients with documentation of a discussion about prognosis or illness understanding, No. (%)	69 (91)	41 (48)	<.001
Illustrative quotes			
"She clearly wanted to understand her prognosis. She was okay with discussing possible times. I told her how imperfect of a science this is, but thought that if she had no treatment she would have problems in the range of 12 to 18 months…If therapies did work they could potentially extend her time, but this is based on if therapies did work for her and did not cause undue side effects."			
"We had a very frank discussion about prognosis. Her performance status has rapidly declined over the past few weeks and we discussed that if her performance status worsened further, she would not be a candidate for further chemotherapy. She and her husband understand that further administration of chemotherapy will most likely cause more harm than good. We also discussed that if her disease were to continue to progress, her life expectancy could be on the order of months."			
Patients with documentation of a discussion about end-of-life care planning, No. (%)	61 (80)	58 (68)	.08
Illustrative Quotes			
"We discussed ***'s decline in the context of her desire to remain in her home, ideally, until she were to pass away. Unfortunately, I had to inform [her] of my concern for her safety and ability to remain at home, alone, beyond a certain point. She was able to identify two local facilities that, should it become necessary, she considers as reasonable alternatives during the end of life stages. She also made it clear, she does not wish to be in [another location] with her daughter for end-of-life as her dearest friends are here."			
"We discussed the role of hospice care today and the ability to manage symptoms at home and provide hydration and palliation without requiring trips to [*]. They are interested in exploring this and we will make arrangements for hospice/bridge-to-hospice [if needed to deal with feeding tube issue]."			
Patients with documentation of a discussion about life-sustaining treatment preferences, No. (%)	48 (63)	27 (32)	.004
Illustrative quotes			
"I also discussed code status with *** today and it was clear that she did not want to do anything heroic. I felt that that was in her best interest and that was my recommendation also based on the fact that she would unlikely be able to come off of a ventilator based on her significant fatigue."			
"We also discussed code status and the measures that the patient would or would not like caregivers to provide in the event of cardiac or pulmonary failure. The patient explicitly stated today that he wants to be do not resuscitate/do not intubate should his heart or lungs fail."			
No. of comprehensiveness of documented conversations, mean (95% CI)			
Documented serious illness conversations per patient	3.1 (2.5-3.6)	2.1 (1.4-2.8)	.02
Documented domains per patient (0-4)[b]	3.2 (2.9-3.6)	1.9 (1.6-2.3)	<.001
Timing of first documented serious illness conversation before death, median (IQR) days	143 (71-325) (n = 73)[c]	71 (33-166) (n = 67)[c]	<.001

Abbreviation: IQR, interquartile range.

[a] Occurrence of at least 1 documented serious illness conversation is defined as the proportion of patients who have at least 1 documented discussion that addressed at least 1 of the 4 serious illness conversation domains: values or goals; prognosis or illness understanding; end-of-life care planning; life-sustaining treatment preferences. Patients who had no evidence of a documented discussion in any of these 4 domains were coded as absent.

[b] Each patient was given a score from 0 to 4 to indicate the presence of

documentation of a discussion in each of the following 4 domains: values or goals; prognosis or illness understanding; end-of-life care planning; life-sustaining treatment preferences. A score of 0 indicates that there was no documentation of a discussion of any of the domains, and a score of 4 indicates that all 4 domains were documented as discussed for that patient.

[c] Numbers of patients differ because category refers only to patients with at least 1 documented conversation.

retrieve documentation of patient goals, values, and preferences, patients may be at increased risk of receiving unwanted care.

The earlier initiation of conversations in the intervention arm marks an important shift from the current practice of beginning serious illness discussions late in the illness course and usually in acute care settings.[6] By prospectively identifying patients and reminding clinicians at the point of care, we stimulated earlier discussions by reducing uncertainties about the appropriate time to start these conversations.[16] Earlier conversations that provide perspective on the patient's disease trajectory and prompt discussion of values and goals in the outpatient setting, in advance of crises, benefit patients by allowing them to make earlier decisions that support their goals and to prepare themselves and their families for the end of life.[3,38,39]

The significant increase in the mean number of documented discussions per patient as a result of the intervention suggests that initiating serious illness communication earlier may prompt more discussions over time.

Rather than only discussing discrete decisions about life-prolonging treatments (eg, cardiopulmonary resuscitation), the conversations driven by the SICP focused on sharing clinical realities and eliciting patients' broader values and goals,[40-43] critical competencies that are increasingly recommended by experts and national consensus bodies[10-14,44,45] and are central to the widely supported goal of shared decision making.[13,14,46,47] Additionally, patients in the intervention arm discussed significantly more conversation domains on average than patients in the control arm, suggesting that the intervention stimulated more comprehensive conversations. The

use of a structured communication tool that provided a patient-centered, psychologically informed script or guide,[10,26,29] accompanied by brief training and supportive coaching, appeared to engage clinicians in a different approach to these difficult conversations, which led to richer and more complete elicitation and documentation of patients' goals and preferences. Although the intervention did not affect the primary outcomes of goal-concordant care and peacefulness, the improvement in the secondary outcomes of anxiety and depression[34] suggests that these values-based discussions may have immediate mental-health benefits for patients with serious illness.

In addition, this study demonstrates the potential system-level value in well-designed, comprehensive changes—including infrastructure improvements. Notably, the use of a structured documentation template in the EMR allows for system-level tracking of critical conversation processes, such as frequency, timing, setting, and key elements addressed, which facilitates local quality-improvement efforts and measurement of communication outcomes.[12,29,45] In addition, when tested in the high-risk primary care context, the SICP intervention has demonstrated significant improvements in the occurrence, quality, and accessibility of documented serious illness conversations for patients before they died,[29] supporting its potential replicability in different populations and clinical settings. Though the multicomponent nature of the intervention prevents a more detailed assessment of the association between individual components and outcomes, we believe that successful implementation of SICP depends on the synergy of its various components. Since each of these intervention components addresses a systems barrier or promotes a best practice in serious illness communication,[10] the effect of serious illness conversations across the illness trajectory is likely the greatest when these components work together. See **Figure 2** for an illustration of how all 4 goals—more, earlier, better, and more accessible conversations—can optimize the effect of serious illness communication on quality of care.

Limitations

This study has several limitations. In this analysis, we examined documented and not actual discussions. Documentation does not capture important clinician communication behaviors, including what words are spoken and how clinicians respond to emotion. The use of documentation to measure and monitor conversations will need to be coupled with other efforts to assess

Figure 2. Maximizing the Effect of Serious Illness Communication
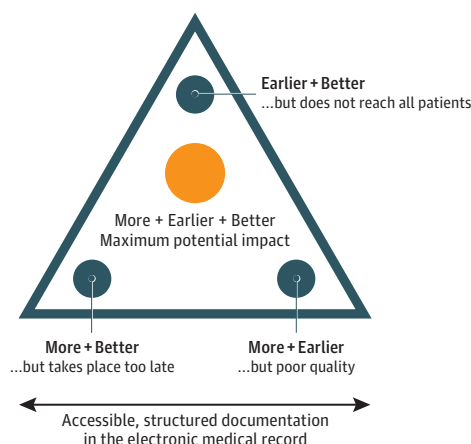
quality of communication, including patient or family experience surveys and the use of audio recording.[12] In this study, we examined oncology notes in the outpatient setting and did not examine inpatient notes, which may have included documentation of goals and values. The differences between arms may also have been attenuated by having all clinicians answer the surprise question and having all patients complete surveys, activities which may have prompted conversations in the control arm. The study's generalizability is limited because it was conducted at a single oncology institution with a relatively homogenous white patient population. Finally, the long-term sustainability of the program is unknown.

Conclusions

In conclusion, our study shows that this institutionwide intervention, which trained and supported oncology clinicians in improving their conversation practices and integrating those conversations into routine outpatient practice, resulted in broad access to more, earlier, and better serious illness conversations for patients with advanced cancer as well as more accessible documentation of these conversations in the EMR. This intervention provides a comprehensive and potentially scalable model for enhancing communication about patient values, goals, and preferences across a system.

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REFERENCES

1. Wright AA, Zhang B, Ray A, et al. Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. *JAMA*. 2008;300(14): 1665-1673. doi:10.1001/jama.300.14.1665

2. Mack JW, Weeks JC, Wright AA, Block SD, Prigerson HG. End-of-life discussions, goal attainment, and distress at the end of life: predictors and outcomes of receipt of care consistent with preferences. *J Clin Oncol*. 2010;28 (7):1203-1208. doi:10.1200/JCO.2009.25.4672

3. Mack JW, Cronin A, Keating NL, et al. Associations between end-of-life discussion characteristics and care received near death:

a prospective cohort study. *J Clin Oncol*. 2012;30 (35):4387-4395. doi:10.1200/JCO.2012.43.6055

4. Leung JM, Udris EM, Uman J, Au DH. The effect of end-of-life discussions on perceived quality of care and health status among patients with COPD. *Chest*. 2012;142(1):128-133. doi:10.1378/chest.11-2222

5. Wright AA, Keating NL, Ayanian JZ, et al. Family perspectives on aggressive cancer care near the end of life. *JAMA*. 2016;315(3):284-292. doi:10. 1001/jama.2015.18604

6. Mack JW, Cronin A, Taback N, et al. End-of-life care discussions among patients with advanced cancer: a cohort study. *Ann Intern Med*. 2012;156(3): 204-210. doi:10.7326/0003-4819-156-3- 201202070-00008

7. Heyland DK, Allan DE, Rocker G, Dodek P, Pichora D, Gafni A; Canadian Researchers at the End-of-Life Network (CARENET). Discussing prognosis with patients and their families near the end of life: impact on satisfaction with end-of-life care. *Open Med*. 2009;3(2):e101-e110.

8. Yung VY, Walling AM, Min L, Wenger NS, Ganz DA. Documentation of advance care planning for community-dwelling elders. *J Palliat Med*. 2010; 13(7):861-867. doi:10.1089/jpm.2009.0341

9. Walker E, McMahan R, Barnes D, Katen M, Lamas D, Sudore R. Advance care planning documentation practices and accessibility in the electronic health record: implications for patient safety. *J Pain Symptom Manage*. 2018;55(2):256-264. doi:10.1016/j.jpainsymman.2017.09.018

10. Bernacki RE, Block SD; American College of Physicians High Value Care Task Force. Communication about serious illness care goals: a review and synthesis of best practices. *JAMA Intern Med*. 2014;174(12):1994-2003. doi:10.1001/ jamainternmed.2014.5271

11. Sudore RL, Lum HD, You JJ, et al. Defining advance care planning for adults: a consensus definition from a multidisciplinary Delphi panel. *J Pain Symptom Manage*. 2017;53(5):821-832.e1. doi:10.1016/j.jpainsymman.2016.12.331

12. Tulsky JA, Beach MC, Butow PN, et al. A research agenda for communication between health care professionals and patients living with serious illness. *JAMA Intern Med*. 2017;177(9): 1361-1366. doi:10.1001/jamainternmed.2017.2005

13. Committee on Approaching Death. *Institute of Medicine. Dying in America: Improving Care and Honoring Individual Preferences Near the End of Life*. Washington, DC: National Academies Press; 2015.

14. Bickel KE, McNiff K, Buss MK, et al. Defining high-quality palliative care in oncology practice: an American Society of Clinical Oncology/American Academy of Hospice and Palliative Medicine guidance statement. *J Oncol Pract*. 2016;12(9): e828-e838. doi:10.1200/JOP.2016.010686

15. You JJ, Downar J, Fowler RA, et al; Canadian Researchers at the End of Life Network. Barriers to goals of care discussions with seriously ill hospitalized patients and their families: a multicenter survey of clinicians. *JAMA Intern Med*. 2015;175(4):549-556. doi:10.1001/jamainternmed. 2014.7732

16. Curtis JR, Patrick DL, Caldwell ES, Collier AC. Why don't patients and physicians talk about end-of-life care? barriers to communication for patients with acquired immunodeficiency syndrome and their

primary care clinicians. *Arch Intern Med*. 2000;160 (11):1690-1696. doi:10.1001/archinte.160.11.1690

17. Chandar M, Brockstein B, Zunamon A, et al. Perspectives of health-care providers toward advance care planning in patients with advanced cancer and congestive heart failure. *Am J Hosp Palliat Care*. 2017;34(5):423-429. doi:10.1177/ 1049909116636614

18. The John A. Hartford Foundation. Physicians' Views Toward Advance Care Planning and End-of-Life Care Conversations. https://www. johnahartford.org/images/uploads/resources/ ConversationStopper_Poll_Memo.pdf. Accessed April 23, 2018.

19. Dickson RP, Engelberg RA, Back AL, Ford DW, Curtis JR. Internal medicine trainee self-assessments of end-of-life communication skills do not predict assessments of patients, families, or clinician-evaluators. *J Palliat Med*. 2012; 15(4):418-426. doi:10.1089/jpm.2011.0386

20. Block SD. Perspectives on care at the close of life. Psychological considerations, growth, and transcendence at the end of life: the art of the possible. *JAMA*. 2001;285(22):2898-2905. doi:10. 1001/jama.285.22.2898

21. Curtis JR, Back AL, Ford DW, et al. Effect of communication skills training for residents and nurse practitioners on quality of communication with patients with serious illness: a randomized trial. *JAMA*. 2013;310(21):2271-2281. doi:10.1001/ jama.2013.282081

22. Au DH, Udris EM, Engelberg RA, et al. A randomized trial to improve communication about end-of-life care among patients with COPD. *Chest*. 2012;141(3):726-735. doi:10.1378/chest.11-0362

23. Epstein RM, Duberstein PR, Fenton JJ, et al. Effect of a patient-centered communication intervention on oncologist-patient communication, quality of life, and health care utilization in advanced cancer: the VOICE randomized clinical trial. *JAMA Oncol*. 2017;3(1):92-100.

24. Doorenbos AZ, Levy WC, Curtis JR, Dougherty CM. An intervention to enhance goals-of- care communication between heart failure patients and heart failure providers. *J Pain Symptom Manage*. 2016;52(3):353-360. doi:10.1016/j.jpainsymman.2016. 03.018

25. Knaus WA, Connors AF, Dawson NV, et al; The SUPPORT Principal Investigators. A controlled trial to improve care for seriously ill hospitalized patients: the study to understand prognoses and preferences for outcomes and risks of treatments (SUPPORT). *JAMA*. 1995;274(20):1591-1598. doi:10. 1001/jama.1995.03530200027032

26. Curtis JR, Downey L, Back AL, et al. Effect of a patient and clinician communication-priming intervention on patient-reported goals-of-care discussions between patients with serious illness and clinicians: a randomized clinical trial. *JAMA Intern Med*. 2018;178(7):930-940. doi:10.1001/ jamainternmed.2018.2317

27. Tulsky JA, Arnold RM, Alexander SC, et al. Enhancing communication between oncologists and patients with a computer-based training program: a randomized trial. *Ann Intern Med*. 2011;155(9):593-601. doi:10.7326/ 0003-4819-155-9-201111010-00007

28. Back AL, Arnold RM, Baile WF, et al. Efficacy of communication skills training for giving bad news and discussing transitions to palliative care.

Arch Intern Med. 2007;167(5):453-460. doi:10.1001/archinte.167.5.453

29. Lakin JR, Koritsanszky LA, Cunningham R, et al. A systematic intervention to improve serious illness communication in primary care. *Health Aff (Millwood)*. 2017;36(7):1258-1264. doi:10.1377/hlthaff.2017.0219

30. Chung HO, Oczkowski SJ, Hanvey L, Mbuagbaw L, You JJ. Educational interventions to train healthcare professionals in end-of-life communication: a systematic review and meta-analysis. *BMC Med Educ*. 2016;16:131. doi:10.1186/s12909-016-0653-x

31. Lord L, Clark-Carter D, Grove A. The effectiveness of communication-skills training interventions in end-of-life noncancer care in acute hospital-based services: a systematic review. *Palliat Support Care*. 2016;14(4):433-444. doi:10.1017/S1478951515001108

32. Bernacki R, Hutchings M, Vick J, et al. Development of the Serious Illness Care Program: a randomised controlled trial of a palliative care communication intervention. *BMJ Open*. 2015;5 (10):e009032. doi:10.1136/bmjopen-2015-009032

33. Moss AH, Lunney JR, Culp S, et al. Prognostic significance of the "surprise" question in cancer patients. *J Palliat Med*. 2010;13(7):837-840. doi:10.1089/jpm.2010.0018

34. Bernacki R, Paladino J, Neville BA, et al. Effect of the serious illness care program in outpatient oncology: a randomized clinical trial [published online March 14, 2019]. *JAMA Intern Med*. doi:10.1001/jamainternmed.2019.0077

35. Lipsitz SR, Kim K, Zhao L. Analysis of repeated categorical data using generalized estimating equations. *Stat Med*. 1994;13(11):1149-1163. doi:10.1002/sim.4780131106

36. Holm S. A simple sequentially rejective multiple test procedure. *Scandinavian J Stat*. 1979;6(2):65-70.

37. Lamas D, Panariello N, Henrich N, et al. Advance care planning documentation in electronic health records: current challenges and recommendations for change. *J Palliat Med*. 2018; 21(4):522-528. doi:10.1089/jpm.2017.0451

38. Steinhauser KE, Christakis NA, Clipp EC, et al. Preparing for the end of life: preferences of patients, families, physicians, and other care providers. *J Pain Symptom Manage*. 2001;22(3): 727-737. doi:10.1016/S0885-3924(01)00334-7

39. Sudore RL, Fried TR. Redefining the "planning" in advance care planning: preparing for end-of-life decision making. *Ann Intern Med*. 2010;153(4): 256-261. doi:10.7326/0003-4819-153-4-201008170-00008

40. Wenrich MD, Curtis JR, Shannon SE, Carline JD, Ambrozy DM, Ramsey PG. Communicating with dying patients within the spectrum of medical care from terminal diagnosis to death. *Arch Intern Med*. 2001;161(6):868-874. doi:10.1001/archinte.161.6.868

41. Curtis JR, Wenrich MD, Carline JD, Shannon SE, Ambrozy DM, Ramsey PG. Understanding physicians' skills at providing end-of-life care perspectives of patients, families, and health care workers. *J Gen Intern Med*. 2001;16(1):41-49.

42. Steinhauser KE, Christakis NA, Clipp EC, McNeilly M, McIntyre L, Tulsky JA. Factors considered important at the end of life by patients, family, physicians, and other care providers. *JAMA*. 2000; 284(19):2476-2482. doi:10.1001/jama.284.19.2476

43. Street RL Jr, Makoul G, Arora NK, Epstein RM. How does communication heal? pathways linking clinician-patient communication to health outcomes. *Patient Educ Couns*. 2009;74(3):295-301. doi:10.1016/j.pec.2008.11.015

44. Jacobsen J, Blinderman C, Alexander Cole C, Jackson V. "I'd recommend ..." how to incorporate your recommendation into shared decision making for patients with serious illness. *J Pain Symptom Manage*. 2018;55(4):1224-1230. doi:10.1016/j.jpainsymman.2017.12.488

45. Sanders JJ, Curtis JR, Tulsky JA. Achieving goal-concordant care: a conceptual model and approach to measuring serious illness communication and its impact. *J Palliat Med*. 2018; 21(S2):S17-S27. doi:10.1089/jpm.2017.0459

46. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001.

47. Kon AA, Davidson JE, Morrison W, Danis M, White DB; American College of Critical Care Medicine; American Thoracic Society. Shared decision making in ICUs: an American college of critical care medicine and American thoracic society policy statement. *Crit Care Med*. 2016;44(1):188-201. doi:10.1097/CCM.0000000000001396