

Effects of a Program for Coordinated Care of Advanced Illness on Patients, Surrogates, and Healthcare Costs: A Randomized Trial

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Objective: To evaluate the Advanced Illness Coordinated Care Program (AICCP), delivered by allied health personnel to improve care for patients coping with advanced illness and in need of preparation for end-of-life (EOL) care.

Study Design: Clinical trial involving 275 patients and 143 surrogates in 6 settings who were randomly assigned to the AICCP or usual care (UC).

Methods: The AICCP participants met with a care coordinator for assistance with provider communication, care coordination, and support. The AICCP was evaluated for effects on satisfaction with care, advance planning, consistency of care with patient preferences, and healthcare costs.

Results: The AICCP increased patient satisfaction with care and communication ($P = .03$), and AICCP surrogates reported fewer problems with provider support ($P = .03$). More AICCP than UC participants completed an advance directive (AD) (69.4% vs 48.4%; $P = .006$), and the AICCP group completed more ADs per participant ($P = .01$). Median time to AD documentation was 46 days for AICCP and 238 days for UC ($P = .02$). There was no difference in survival (AICCP 43% vs UC 42%). Six-month costs were lower with AICCP than with UC (\$12 123 vs \$16 295); however, the difference did not reach statistical significance.

Conclusions: The AICCP improved satisfaction with care and helped patients develop and revise more ADs, sooner, without affecting mortality. This program may be delivered in a range of managed care, fee-for-service, and group-model settings.

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The need to improve the care of patients coping with advanced illness and preparing for end-of-life (EOL) care is well documented. Shortcomings in the medical, psychological, spiritual, and practical domains of care have been described by experts¹ and researchers.² Many Americans are dying subsequent to unwanted care, in unrelieved pain, and with their preferences for treatment inadequately discussed, documented, and followed.^{1,3,4} Care at the EOL often is fragmented because it is delivered by different providers in different settings.

For these reasons, the quality of life of many people with serious illness is compromised. These shortcomings will eventually affect more Americans: more than 73% of deaths occur after age 65 years, and this age

group is projected to increase as the baby-boom cohort enters old age.⁵ Because of importance of delivering improved care, the Institute of Medicine recommends conducting research on the utility of new care strategies.¹

The demands of the aging baby-boom generation for more input and better treatment during advanced illness are mobilizing efforts to improve EOL care.⁶ Recent efforts to improve care include the development of Palliative Care Leadership Centers,⁷ hospice consultation teams,⁸ hospital-based palliative care teams,⁹ and pre-hospice and care management programs.¹⁰ In addition, greater attention is being paid to EOL care in medical training and practice,¹⁰ and to development of models for facilitating structured EOL discussions, including interventions that focus on advance planning.¹¹⁻¹⁵

The Advanced Illness Coordinated Care Program (AICCP) was developed to improve the care of people with serious illness.¹⁶ It is a care coordination and support program delivered by allied health providers (eg, nurses, social workers) as a part of physician-directed care plans. The AICCP is designed to promote communication and understanding between patients and providers about advanced illness and EOL issues to promote health literacy, to achieve coordination of care, to provide emotional and social support, and to reduce barriers to the use of palliative care and hospice services. AICCP can be delivered in acute-care, primary care, or long-term care settings and as a component of disease management or case management services. It is delivered concurrently while patients are receiving life-pro-

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longing treatments and before referral to specialty palliative services.

The development of AICCP was guided by clinical experience,¹⁷ previous outcome studies,² and recommendations for improving care coordination and support from the health literature and the managed care industry.¹⁷⁻¹⁹ AICCP is designed to address reported barriers to quality care,²⁰ like readiness to prepare for EOL care.²¹ AICCP uses proactive strategies explicitly designed to promote readiness.

To test the effectiveness of AICCP for helping people cope with advanced illness and EOL decisions and to ascertain the program utility from quality and cost perspectives, we conducted a randomized, controlled trial comparing AICCP patients and surrogates with patients and surrogates receiving usual care (UC). We describe the impact of the AICCP on patient and surrogate satisfaction with healthcare and provider communication, formulation and development of advance directives (ADs), whether the received medical care was consistent with the patient's AD, and healthcare costs.

DESIGN AND METHODS

Participants

Participants were recruited from 3 Department of Veterans Affairs medical centers (VAMCs), a home care organization, and 2 managed care organizations. Patients had chronic obstructive pulmonary disease (COPD), chronic heart failure (CHF), or cancer diagnoses including those of the esophagus, trachea, colon, liver, pancreas, lung, or uterus; cancers of the prostate or breast with metastasis; and melanoma, leukemia, lymphosarcoma, Hodgkin's disease, or multiple myeloma. Patients with COPD or CHF were eligible if they had experienced 1 or more admissions to an intensive-care unit or 2 or more acute-care admissions in the last 6 months.

Table 1 shows demographic information on patients. **Table 2** shows demographic information on surrogates.

Study Protocol

The study protocol was approved by institutional review boards at each site. Recruiters blinded to group assignment enrolled 275 patients. We used Research Randomizer version 3²² to randomize participants in blocks of 10 into AICCP (n = 133) or UC (n = 142). Approximately 60% of the patients identified a surrogate, of which 168 (76 in the AICCP group and 92 in the UC group) agreed to participate.

One hundred eighty-six patients (AICCP = 86, UC = 100) and 143 surrogates (AICCP = 67, UC = 76) com-

pleted the study and a follow-up assessment at approximately 3 months postenrollment. The AICCP was gradually implemented as part of UC in some VAMC inpatient units before study closure. Therefore, as specified in the institutional review board approval, patients were free to cross over to the alternative treatment arm in spite of their randomization status because administrators wanted to make AICCP available on units where AICCP was introduced into UC and participants requested AICCP. Eighteen UC participants crossed over to AICCP, and 2 AICCP participants crossed into UC. Intention-to-treat analyses were performed with participants in their originally assigned groups.²³

Intervention

The AICCP delivers care coordination and support through 6 functions. The first is physician support, which consists of helping patients develop well-organized questions to make economical use of provider time and ensuring that physicians have complete information about patients. The second is health literacy, which is the capacity to understand basic health information.²⁴ The AICCP addresses literacy concerns in each session (eg, by helping patients comprehend specialized medical terminology, which both increases their understanding and reduces their embarrassment). The third function is care coordination, which is locating and arranging linkages to medical services. The fourth is prevention, which refers to a focus on those aspects of EOL planning that often are avoided and emotionally charged. In this study, prevention referred to efforts to reduce or eliminate common psychosocial concerns related to advanced illness such as (1) coping with the loss of ability to perform valued activities; (2) identifying and addressing family conflict around difficult advanced illness and EOL decisions (eg, patient relocation, financial burdens of illness); (3) avoiding caregiver burnout (eg, by dividing care among family members); (4) anticipating emotional reactions (eg, anticipatory grief, fear of death); (5) enhancing self-management skills by preparing patients and families to cope with health system delivery shortfalls (eg, fragmentation of care delivery, gaps in care); and (6) promoting advance planning, because timely planning may avert decision making in crisis situations.¹¹

Care coordinators help clarify patient preferences for care under different health scenarios, using worksheets designed for this purpose.¹⁴ If patients engage in advance planning, care coordinators assist them in formulating and documenting ADs and discussing them with providers. Family misunderstandings about care issues frequently can be resolved during meetings with care coordinators, reducing physician time spent medi-

ating between family members. Care coordinators also provide emotional and social support. Emotional support consists of attending to affective components of illness, identifying specific emotions, helping patients cope with suffering, and providing referrals for ongoing counseling. Social support includes guidance and information, as well as tangible support. In the AICCP, structured guidance support helps patients and caregivers complete tasks needed to maintain health and function.²⁵ The AICCP provides information support in the form of guiding patients through the immense amount of medical information available to sources that are (1) adjusted for health literacy, (2) endorsed by their physicians, and (3) relevant to their situations. It provides tangible support by locating and arranging social support services. These functions are performed by nurses, nurse practitioners, or social workers.

The AICCP was implemented in a 6-session format and delivered by existing personnel who were familiar with institutional policies and who had ongoing relationships with providers. These personnel were chosen because a reported barrier to effective implementation of an EOL program was using staff without an institutional identity and credibility.²¹ Care coordi-

Table 1. Characteristics of Patient Participants by Treatment Group

Variable	No. (%)*		Test of Differences
	AICCP Group	Usual Care Group	
No. of participants	133 (48.4)	142 (51.6)	$\chi^2(1) = 0.30; P = .59$
Age, y			
<40	1 (0.8)	0 (0)	
40-49	4 (3.3)	5 (3.8)	
50-59	16 (13.1)	13 (9.8)	
60-69	22 (18.0)	37 (28.0)	
70-79	53 (43.4)	51 (38.6)	
≥80	26 (21.3)	26 (19.7)	
Mean	70.72	70.80	$t(273) = -0.06; P = .96$
Sex			$\chi^2(1) = 1.079; P = .30$
Female	25 (18.8)	34 (23.9)	
Male	108 (81.2)	108 (76.1)	
Race			$\chi^2(2) = 1.69; P = .43$
White	117 (88.0)	120 (85.7)	
Black	15 (11.3)	16 (11.4)	
Other	1 (0.8)	4 (2.9)	
Marital status			$\chi^2(1) = 0.27; P = .60$
Married	59 (44.7)	67 (47.9)	
Not married	73 (55.3)	73 (52.1)	
Living arrangement			$\chi^2(1) = .31; P = .58$
Alone	54 (40.6)	53 (37.3)	
Not alone	79 (59.4)	89 (62.7)	
Education			$\chi^2(4) = 3.12; P = .53$
Less than high school graduate	36 (27.1)	44 (31.4)	
High school graduate	54 (40.6)	52 (37.1)	
Some college	28 (21.1)	26 (18.6)	
College graduate	8 (6.0)	14 (10.0)	
Graduate or professional	7 (5.3)	4 (2.9)	
Religion			$\chi^2(3) = 4.78; P = .19$
Protestant	66 (52.4)	75 (55.6)	
Catholic	48 (38.1)	53 (39.3)	
Jewish	1 (0.8)	3 (2.2)	
Other	11 (8.7)	4 (3.0)	
Diagnosis			$\chi^2(3) = 2.37; P = .50$
Cancer	84 (63.2)	94 (66.2)	
Chronic obstructive pulmonary disease	27 (20.3)	25 (17.6)	
Congestive heart failure	22 (16.5)	21 (14.8)	
Other	0 (0.00)	2 (1.4)	
Insurance			$\chi^2(4) = 6.92; P = .14$
Medicare	80 (60.2)	88 (62.4)	
Medicaid	7 (5.8)	5 (3.5)	
Private	5 (3.8)	6 (4.3)	
Uninsured	3 (2.3)	12 (8.5)	
Other	38 (28.6)	30 (21.3)	
Hollingshead Index of Social Position			$\chi^2(4) = 1.62; P = .81$
Upper	5 (3.9)	4 (2.9)	
Upper middle	13 (10.2)	17 (12.3)	
Middle	39 (30.7)	35 (25.4)	
Lower middle	48 (37.8)	53 (38.4)	
Lower	22 (17.3)	29 (21.0)	

AICCP indicates the Advanced Illness Coordinated Care Program.

*Owing to missing data, some percentage totals do not equal 100%.

Table 2. Characteristics of Surrogate Participants by Treatment Group

Variable	No. (%)*		Test of Differences
	AICCP Group	Usual Care Group	
No. of participants	67 (46.9)	76 (53.1)	$\chi^2(1) = 0.57; P = .45$
Sex			$\chi^2(1) = 0.10; P = .75$
Female	56 (83.6)	62 (81.6)	
Male	11 (16.4)	14 (18.4)	
Relationship to patient			$\chi^2(8) = 9.34; P = .32$
Spouse	37 (55.2)	38 (50.0)	
Partner	1 (1.5)	5 (6.6)	
Child	14 (20.9)	19 (25.0)	
Child-in-law	2 (3.0)	0 (0.0)	
Parent	0 (0.0)	3 (3.9)	
Sibling	8 (11.9)	6 (7.9)	
Other relative	1 (1.5)	1 (1.3)	
Friend	3 (4.5)	4 (5.3)	
Other	1 (1.5)	0 (0.0)	

AICCP indicates the Advanced Illness Coordinated Care Program.
*Owing to missing data, some percentage totals do not equal 100%.

nators' salaries were contributed by study sites. Sites replaced care coordinators if their resources allowed; if not, care coordinators' duties were reconfigured to focus on patients with advanced illness. Each care coordinator attended training and reviewed assigned readings, including the AICCP training manual.^{15,17} Program delivery was standardized across sites through conference calls and followed a structured-visit format. Care coordinators were taught to individualize the program to meet specific needs; for example, patients could schedule extra meetings. The mean number of visits was 4.92 (SD = 2.94).

Assessment of Intervention Integrity

To assess treatment fidelity, we examined treatment implementation checklists for a randomly selected subset of patients. Checklists covered AICCP-recommended interventions. The intervention elements were completed in 72% to 95% (mean = 83%) of patient visits. The most common reason for not completing an element was that it did not apply to patients' circumstances.

Measurement of Outcomes

To evaluate the impact of AICCP, participants were asked at enrollment and at 3 and 6 months postenrollment about the effectiveness of patient/provider communication, their satisfaction with care, and their

willingness to participate in treatment planning. Effectiveness of patient-provider communication and satisfaction with healthcare were measured on an investigator-constructed, 10-item scale. Reliability measured at enrollment using Cronbach's alpha was .80. The patient satisfaction items on the questionnaire were measured on a 5-point Likert-type scale: 1, "very dissatisfied"; 2, "dissatisfied"; 3, "neither satisfied nor dissatisfied"; 4, "satisfied"; and 5, "very satisfied." Patients' attitudes about participating in treatment planning were assessed by a single item

measuring low, medium, or high levels of involvement in decision making.

Surrogates' experiences with the healthcare system were measured at 3 months postenrollment, using a modified EOL Family Interview. This instrument measured surrogate satisfaction with patient care and the number of problems with the healthcare system experienced by family and patients. Its psychometric properties have been established.²⁶ Surrogates indicated the presence or absence of problems in 7 domains: (1) shared decision making, (2) physical comfort and emotional support, (3) advance care planning, (4) coordination of care, (5) personal care and respect, (6) family self-efficacy, and (7) family emotional and spiritual support. The number of problems in each domain was averaged to create a problem score for that domain. In addition, 6 items measuring satisfaction with care were rated on an 11-point scale (with 0 being the worst care possible, and 10 the best care possible). These items were averaged to create a single overall rating of care.

Program contact, salary, and overhead costs were combined for care coordinators from 3 sites (the VAMCs) to estimate the mean per-case cost of providing AICCP. Care coordinators collected data on contacts for 70 patients, including the person contacted and the length and reason for the contact. Care coordinators also documented time spent on other tasks such as charting and contacting providers.

Cost data were gathered for 169 participants (AICCP = 93, UC = 76) from VAMC cost records from 6 months preenrollment to 6 months postenrollment. Veterans' Affairs medical centers records for 180 participants (AICCP = 85, UC = 95) were reviewed to track the formulation and documentation of ADs. Department of Veterans Affairs (VA) records were examined for ADs (healthcare proxies or living wills). The dates and types of ADs were recorded, and AD status (yes/no) was determined for participants at enrollment and 3 and 6 months postenrollment. The number of ADs found was also summed at these time points. Because, like ADs, do-not-resuscitate and intubate (DNR[I]) orders imply patient awareness of unwanted health outcomes and communication and action about them with providers, the same information was collected for DNR(I) orders.

Analyses

The AICCP and UC participants were compared on demographic and other characteristics at enrollment (Table 1 and Table 2). To assess the effect of AICCP on satisfaction with healthcare and communication with providers, we used a random effects regression model.²⁷ Patient satisfaction scores were examined for significant effects of group, time, and group-by-time interaction. To assess the strength of the intervention effects, we calculated effect sizes as the ratio of the estimated treatment effect (follow-up satisfaction scores minus enrollment satisfaction scores) to the pooled standard deviations at enrollment.²⁸

Because surrogates were not interviewed at enrollment, groups were compared only on posttest scores for each of the 7 healthcare domains identified in the EOL Family Interview and on posttest mean ratings of overall care. Comparisons were made by using *t* tests, and effect sizes were calculated by using the means and standard deviations at posttest.

Participant-level costs from 6 months before enrollment through 3 and 6 months postenrollment were abstracted from the VA database. Costs included inpatient, outpatient, nursing home, inpatient hospice, and an "other" cost component (diagnostic services, medications, durable medical equipment, prosthetics, VA care provided in non-VA settings, and administrative overhead). Because a Wald test indicated multivariate nonnormality in the data, they were square-root-transformed in order to meet assumptions for normality. Effect size for cost was calculated the same as it was for satisfaction outcomes.

To examine the association between group membership and time to completion of ADs, an analysis of time from enrollment to completion of the first AD was performed. Kaplan-Meier curves for the AICCP and UC

groups from enrollment to 6 months postenrollment were compared, using a log-rank test. A chi-square comparison of the percentages in the 2 groups who completed at least 1 AD by 6 months postenrollment was performed. Mean differences in total numbers of ADs completed during the 3 months and the 6 months after enrollment also were compared with the *t* test.

RESULTS

Baseline Characteristics/Survival

Demographics presented in Tables 1 and 2 indicate no statistically significant differences between the AICCP and UC groups at enrollment. Although AICCP was not expected to have an impact on survival, analyses were conducted using Cox's proportional model to verify this expectation. No significant differences were found. Survival rates at 18 months postenrollment were 43% for the AICCP group versus 42% for the UC group.

Psychosocial Effects of the Program

Analyses yielded a significant group-by-time interaction. The AICCP patients reported significantly greater increases in satisfaction from pretest (mean = 3.70, SD = .74) to posttest (mean = 4.07, SD = .68) than UC patients, whose pretest mean was 3.83 (SD = .76) and whose posttest mean was 3.98 (SD = .67) ($F[1, 184] = 4.88, P = .03$). Effect size of AICCP on patient satisfaction was 0.18. The AICCP and UC patients did not differ in their attitudes about participating in treatment decisions ($F[1, 168] = 0.01, P = .90$).

Posttest score analyses also showed significant positive effects of participation on surrogates. Fewer problems were reported by AICCP surrogates (mean = .41, SD = .30) than UC surrogates (mean = .53, SD = .32) with the spiritual and emotional support delivered by providers ($t[141] = 2.27, P = .03$). The effect size for this difference was 0.39, indicating a moderate impact of AICCP on surrogates.

Effect on Healthcare Costs

The average cost of AICCP delivery, including salary and administrative costs, was \$452.12 per case. Results of analyses using the random effects regression model revealed a significant time effect, with both groups incurring higher costs over time from 6 months preenrollment to 6 months postenrollment (Table 3). On average, AICCP costs per patient were \$12 123 versus \$16 295 for UC—a \$4172 (25%) difference, with an effect size of .18. This represents a statistically nonsignificant trend toward total lower cost from 6 months preenrollment to 6 months postenrollment. Cost analy-

Table 3. Healthcare Costs of Patient Participants by Treatment Group and Time

Time	Costs, \$		Group	df	F Test	P
	Mean	SD				
T1: 6 months prebaseline				1178	0.12	.7326
AICCP	7770.59	10 375.66	T1:T2	1534	68.35	<.0001
Usual care	8518.26	13 862.03	T1:T3	1534	70.42	<.0001
T2: 3 months prebaseline			T1:T4	1534	0.82	.3650
AICCP	17 678.19	16 478.08	T2 × Group	1534	0.00	.9727
Usual care	19 701.95	24 492.43	T3 × Group	1534	0.00	.9715
T3: 3 months postbaseline			T4 × Group	1534	1.12	.2894
AICCP	19 558.65	20 964.62				
Usual care	21 329.37	28 834.79				
T4: 6 months postbaseline						
AICCP	12 123.37	16 036.13				
Usual care	16 295.46	28 491.71				

AICCP indicates the Advanced Illness Coordinated Care Program.

ses were based on subjects from VAMC sites because only VAMC sites had reliable data on cost outcomes.

Effects on Advance Directives

At baseline there were no differences between AICCP and UC in AD status ($\chi^2[1] = 0.177, P = .758$) or in total number of ADs ($t[178] = 0.296, P = .768$). Three analyses were performed on postbaseline AD data: (1) time to first AD, (2) group differences in the percentage of ADs by 3 and 6 months postbaseline, and (3) group differences in the total number of ADs by 3 and 6 months postbaseline. DNR(I)s were excluded from the following analyses because no group differences were found at any measurement period.

Results of the first AD analysis appear in the **Figure**. The Kaplan-Meier plot shows a significant difference in trend between the groups in time to completion of ADs. Median time to completion of first AD for AICCP was 46 days, whereas for UC it was 238 days ($\log\text{-rank } P = .02$).

By 3 months postbaseline, 64.7% of AICCP participants versus 43.2% of UC participants had completed at least 1 AD ($\chi^2[1] = 8.37, P = .005$). By 6 months, 69.4% of AICCP participants versus 48.4% of UC participants had completed at least 1 AD ($\chi^2[1] = 8.13, P = .006$).

The mean number of ADs per patient was significantly higher for AICCP (mean = 1.22, SD = 1.00) than for UC (mean = 0.82, SD = 1.06) at 3 months ($t[178] = 2.604, P = .01$). This also was true for AICCP (mean = 1.33, SD = 0.98) and UC (mean = 0.93, SD = 1.07) at 6 months ($t[178] = 2.55, P = .01$).

DISCUSSION

This study showed that people receiving AICCP were willing and able to plan for EOL care both more frequently and months earlier than those receiving UC. The AICCP resulted in more patients completing ADs and more total ADs completed by the patients. Also, the ADs were completed 6.3 months earlier than those completed by patients receiving UC. These findings suggest that AICCP enabled timely planning for patients at risk for adverse health events and promoted more frequent involvement, an important goal of care.²⁹ Patients and families were more satisfied with AICCP-supported care delivery than with UC. Satisfaction results suggest that UC improved within the “neither satisfied nor dissatisfied” range, whereas AICCP improved ratings from “neither satisfied nor dissatisfied” to “satisfied.” The AICCP had a low per-case expenditure and did not increase total costs. The increased preparation for EOL care in AICCP (eg, documenting ADs) does not appear to have affected survival. The lack of differences between AICCP and UC on the measure to assess patients’ views about their participation in decision making may mean that patients accepted the level of involvement provided by their clinicians as the most that was available. It also may reflect effort on the part of UC clinicians to engage in shared decision making.

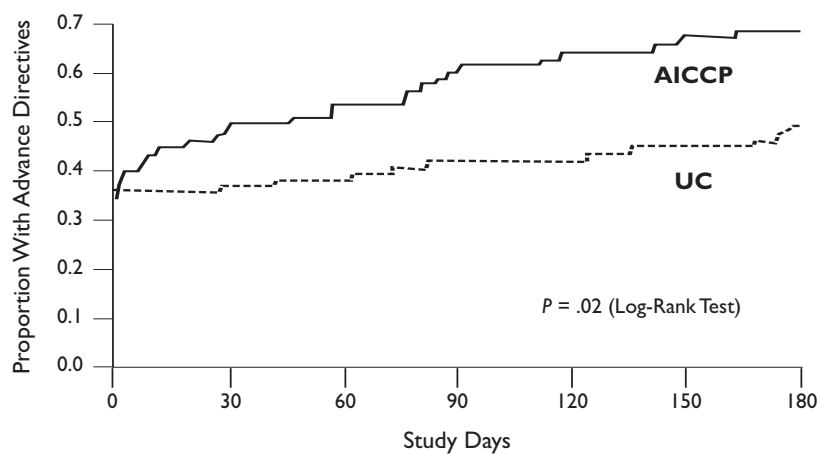
This study was conducted in settings where AICCP was implemented with administrative and clinical backing for improved EOL care, prompted by pioneering

studies like the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments (SUPPORT).²¹ In SUPPORT sites, intervention nurses without an employment history in the setting felt isolated and did not perceive their communication with physicians as effective. Murphy and colleagues²⁰ judged these factors as barriers to program implementation. Also, SUPPORT patients were so ill that 53% of the patients were unable to be interviewed about their EOL preferences within 2 or 3 days after enrollment,²⁰ whereas AICCP participants were recruited earlier in illness trajectories and were more likely to participate in, and benefit from, AICCP. In addition, because SUPPORT nurses frequently mentioned that patients deferred making EOL decisions because they felt unready to make them,²¹ AICCP was developed with strategies to address inability or unwillingness to engage in decision making, starting with the first visit.

There are limitations to this study. Generalizability of the findings to populations with different demographic characteristics (eg, female, nonwhite), to those with less serious medical problems (eg, outpatients), and to those with other diagnoses is limited, and should be considered when interpreting and using the findings. However, because 87% of surrogates were female, a proportion similar to that in other studies involving surrogates,^{30,31} positive effects of AICCP on surrogates may be generalizable.

The time frame of the study did not allow for a longer evaluation of the cost differences, or for the recruitment of a larger sample. It is possible the cost differences might have reached significance if measured over a longer time or with a larger sample, but these measurements remain to be done in another study. Even if a similar cost distribution were found for a larger sample, a retrospective power analysis showed that it would take approximately 400 participants per condition for the cost differences found in this study to reach significance. Also, this study did not include analyses of outcomes for differences among diagnoses. Other research has shown that EOL care costs may vary by diagnosis.³²⁻³⁴ Thus, future research on long-term cost outcomes for AICCP in larger samples stratified by diagnostic groups is recommended. Such research may determine whether short-term trends in cost reduction found in this study for AICCP apply in larger samples, for specifi-

Figure. Kaplan-Meier Plot of Time to First Advance Directive Completion*



AICCP indicates the Advanced Illness Coordinated Care Program; UC, usual care.

*The median time to completion of the first advance directive was 46 days for AICCP and 238 days for UC. The numbers of AICCP patients (n = 85) at risk for not completing ADs were 56 (0 days), 44 (30 days), 40 (60 days), 34 (90 days), 31 (120 days), 28 (150 days), and 27 (180 days). The numbers of UC patients (n = 95) at risk for not completing ADs were 61 (0 days), 60 (30 days), 59 (60 days), 55 (90 days), 55 (120 days), 53 (150 days), and 49 (180 days).

ic diagnostic groups, in other health settings (eg, disease management and prevention programs for patients with progressive illness), or over longer time periods. Also, AICCP and UC were not compared on receipt of a comfort care benefit (eg, hospice referrals), a useful measure of longer term effects of increasing AD documentation that should be included in future studies. Further, cost comparisons involved both decedents and living participants. Cost comparisons for decedents alone may more accurately reflect EOL expenditures.

In summary, AICCP is a care strategy with specific clinical services that helps patients transition from chronic to advanced illness and prepare for EOL care. It promotes advance planning and improves satisfaction with care. The average cost of providing AICCP was \$452.12 per patient. Therefore, AICCP appears to be a low-cost strategy that can help time-pressed physicians meet care coordination and support responsibilities for delivering care to patients with complex illness. The AICCP components of care coordination and support can be delivered in a wide range of managed care settings and integrated with physician treatment plans by allied health professionals.

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