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Influence of Patients' Preferences and Treatment Site on Cancer Patients' End-of-Life Care

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Abstract

BACKGROUND—Research suggests that patients' end-of-life (EOL) care is determined primarily by the medical resources available, and not by patient preferences. The authors examined whether patients' desire for life-extending therapy was associated with their EOL care.

METHODS—Coping with Cancer is a multisite, prospective, longitudinal study of patients with advanced cancer. Three hundred one patients were interviewed at baseline and followed until death, a median of 4.5 months later. Multivariate analyses examined the influence of patients' preferences and treatment site on whether patients received intensive care or hospice services in the final week of life.

RESULTS—Eighty-three of 301 patients (27.6%) with advanced cancer wanted life-extending therapy at baseline. Patients who understood that their disease was terminal or who reported having EOL discussions with their physicians were less likely to want life-extending care

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Drs. Prigerson and Wright had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of data analysis. Drs. Wright and Prigerson were responsible for the study design and conception; Dr. Prigerson obtained funding for the study and was responsible for data acquisition; Drs. Wright, Mack, Kritek, Balboni, Massaro, Matulonis, Prigerson, and Block analyzed and interpreted the data; Dr. Wright conducted statistical analyses and drafted the article; and Drs. Wright, Mack, Kritek, Balboni, Massaro, Matulonis, Prigerson, and Block critically revised the article for important intellectual content.

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compared with others (23.4% vs 42.6% and 20.7% vs 44.4%, respectively; $P = .003$). Patients who were treated at Yale Cancer Center received more intensive care (odds ratio [OR], 3.14; 95% confidence interval [CI], 1.16-8.47) and less hospice services (OR, 0.52; 95% CI, 0.29-0.92) compared with patients who were treated at Parkland Hospital. However, in multivariate analyses that controlled for confounding influences, patients who preferred life-extending care were more likely to receive intensive care (adjusted OR [AOR], 2.91; 95% CI, 1.09-7.72) and were less likely to receive hospice services (AOR, 0.45; 95% CI, 0.26-0.78). Treatment site was not identified as a significant predictor of EOL care.

CONCLUSIONS—The treatment preferences of patients with advanced cancer may play a more important role in determining the intensity of medical care received at the EOL than previously recognized. Future research is needed to determine the mechanisms by which patients' preferences for care and treatment site interact to influence EOL care.

Keywords

treatment preferences; cancer; terminal illness; end-of-life care; communication; prognosis; intensive care; treatment site; hospice

Results from population-based studies suggest that the most powerful determinant of end-of-life (EOL) care is the regional supply of healthcare resources available, and not patient preferences.^{1,2} Several studies have demonstrated that individuals who live in areas with a high number of medical specialists and hospital beds per capita are more likely to receive intensive care at the EOL compared with individuals who live in areas with fewer medical resources.¹⁻⁴ A major limitation of those studies, however, is that most lacked information about patients' treatment preferences and, thus, could not directly address the extent to which these preferences influenced the actual care that patients ultimately received.

To date, few studies have prospectively examined the associations between advanced cancer patients' treatment preferences and their EOL care. In the early 1990s, a small study of hospitalized cancer patients indicated that patients who wanted life-extending care were not more likely to receive life-sustaining treatments near death.⁵ In 1995, a large, multisite study—the Study to Understand Prognoses and Preferences for Risks and Outcomes of Treatment (SUPPORT)—demonstrated that patients with advanced cancer were more likely to receive aggressive interventions near death if they preferred life-extending therapies over supportive care.⁶ However, further analyses of these data suggested that this association may be limited to elderly patients.⁷

The primary objective of the current report was to examine whether patients' preference for life-extending care was associated with an increased use of intensive care at the EOL in a multisite, prospective, longitudinal study of patients with advanced cancer. We expected to find site-based differences in the rates of healthcare use, but we hypothesized that patients' treatment preferences would be more important predictors of patients' EOL care (ie, use of intensive care or hospice services) than treatment site.

MATERIALS AND METHODS

Coping with Cancer was a federally funded, prospective, longitudinal, multisite cohort study of terminally ill cancer patients and their informal caregivers (eg, spouse or adult child).⁸ This report describes 301 patients who were recruited between September 2002 and February 2008 whose self-reported treatment preferences were available and who died during the course of the study. Patients were recruited from 4 different outpatient sites: Yale Cancer Center (New Haven, Conn), Simmons Comprehensive Cancer Center (Dallas, Tex), Parkland Hospital (Dallas, Tex), and New Hampshire Oncology-Hematology (Hooksett,

NH). The intensity of medical services available varied by site. For example, the Hospital Care Intensity Score, a standardized measure that was developed by the Dartmouth Health Atlas to capture the intensity of inpatient services delivered at different hospitals, was highest at Simmons Comprehensive Cancer Center and Yale Cancer Center (89.8 and 53.7, respectively) and was lowest at New Hampshire Oncology-Hematology and Parkland Hospital (24.0 and 12.2, respectively).⁹ Yale Cancer Center, Simmons Comprehensive Cancer Center, and Parkland Hospital are tertiary care facilities, whereas New Hampshire Oncology-Hematology is an outpatient private practice that admits to 6 different regional hospitals but is not directly affiliated with a tertiary referral center.

Participants were identified from outpatient clinics. Eligibility criteria included: a diagnosis of advanced cancer (ie, the presence of distant metastases and disease refractory to first-line chemotherapy), age \geq 20 years, and clinic staff and interviewer assessments that the patient had adequate stamina to complete the interview. Patients also were required to have an informal caregiver, because the objective of the larger study, Coping with Cancer, was to examine how psychosocial factors influence both patients' EOL care and their caregivers' bereavement adjustment. Patient-caregiver dyads in which either the patient or the caregiver refused to participate, met criteria for dementia or delirium (determined by neurocognitive status examination), or did not speak either English or Spanish were excluded. All enrolled patients provided written, informed consent, and approval was obtained from the human subjects committees of all participating centers.

Upon study enrollment, trained research staff interviewed each participant individually in either English or Spanish. Patients received \$25 as compensation for completing the interviews, which lasted an average of 45 minutes. Research staff also reviewed the medical record and verified each patient's diagnosis, treatment, and performance status with the physician. After each patient's death, a chart review and postmortem interview with patients' caregivers were performed to confirm the type of medical care received at the EOL and the patient's place of death.

Measures

Treatment preferences—During the baseline interview, patients were asked, “If you could choose, would you prefer: 1) a course of treatment that focused on extending life as much as possible, even if it meant more pain and discomfort, or 2) on a plan of care that focused on relieving pain and discomfort as much as possible, even if that meant not living as long?” Response options were, “extend life as much as possible,” “relieve pain or discomfort as much as possible,” or “don't know.” This measure has been used in several studies of terminally ill patients, including the SUPPORT trial, in which it was associated with the number of therapeutic interventions received.⁶

Sociodemographic characteristics—Patients were asked to provide information on their age, sex, race/ethnicity, religion, marital status, health insurance coverage, and last grade completed in school.

Health measures—Patients' performance status was assessed with the Karnofsky score, a measure of functional status that is predictive of survival in which 0 indicates dead and 100 indicates perfect health.¹⁰ Comorbid illnesses were determined by using the Charlson Comorbidity Index, a measure of chronic illness in which higher numbers signify more medical comorbidities.¹¹ Patients' quality of life was assessed with the McGill Quality of Life Questionnaire, a measure of physical, psychological, and existential well being that has been validated in patients with terminal illness.¹²

Communication, prognostic understanding, and advance care planning—In the baseline interview, patients were asked, “If your physician knew how long you had left to live, would you want him or her to tell you?” Response options were “yes” or “no.” Patients’ prognostic understanding was measured with the following question: “How would you describe your current health status?” Response options were: “relatively healthy,” “seriously ill but not terminally ill,” or “seriously and terminally ill.” Patients who responded “seriously and terminally ill” were coded as understanding that their illness was terminal. This measure has been used in several studies of terminally ill patients in which it was associated with higher rates of do-not-resuscitate orders and the use of hospice services.^{13,14} Patients also were asked about their relationship with their oncology provider. A close patient-physician relationship was defined as 1 in which the patients trusted and respected their physicians, felt respected and “seen as a whole person,” and were very comfortable asking questions about their care.⁸

End-of-Life Medical Care—Postmortem chart reviews were performed to determine the intensity of medical care received in the final week of life and patients’ place of death (ie, intensive care unit (ICU), inpatient hospital, inpatient hospice, nursing home, or home). Services, which have been defined previously in the literature as indicators of aggressive care, were recorded and included: admission to an ICU, mechanical ventilation, and resuscitation.¹⁵ The use of outpatient hospice services also was documented. The primary outcome of interest was receipt of intensive medical care in the final week of life, which we defined as cardiopulmonary resuscitation (CPR) and/or mechanical ventilation followed by death in an ICU. A secondary outcome of interest was receipt of hospice services, either at home or in an inpatient hospice, during the last week of life.

Statistical Methods

Comparative tests were performed to determine whether there were significant differences between patients who reported a preference for receiving life-extending treatments at baseline compared with patients who did not report such a preference. *T*-tests were used to analyze continuous variables, and chi-square and Fisher exact test statistics were used to analyze binary and categorical variables. A Cox proportional hazards model was used to examine differences in survival between the 2 groups. A log-rank test was used to determine whether the groups differed significantly with regard to survival. The study sample was divided into 12 groups according to survival from enrollment (in months), and a 1-way analysis of covariance was performed to determine whether patients’ treatment preferences differed according to their proximity to death, this analysis was adjusted for treatment site and EOL discussion.

Logistic regression models were used to examine associations between patients’ treatment site and the intensity of medical services received (eg, intensive care or hospice services). Multivariate analyses examined associations between patients’ treatment preferences, treatment site, and the intensity of EOL care. Every variable that was associated ($P < .20$) with both the predictor (treatment preferences) and the outcome (intensive care or hospice services) in bivariate analyses was investigated as a potential confound and was retained if it remained significant at a level of $P < .05$. Statistical analyses were performed with SAS software (version 9.1; SAS Institute, Inc, Cary, NC).

RESULTS

Patient Characteristics

The cohort consisted of 301 patients with advanced cancer who died a median of 4.5 months after enrollment. The participants’ baseline characteristics are reported in Table 1. Overall,

83 of 301 patients (27.6%) with terminal illness preferred a course of treatment focused on extending life over care focused on relieving pain and discomfort. Patients who were younger, men, or self-identified as black race/ethnicity were more likely to prefer life-extending treatments (all $P < .03$) compared with others. Patients who received treatment at Yale Cancer Center also were more likely to prefer life-extending care compared with patients who received treatment at the other examined sites (38.7% vs 23.9%; $P = .01$).

No associations were observed between patients' treatment preferences and their marital status, education, insurance status, use of religion to cope, cancer type, performance status, medical comorbidities, quality of life, or survival. Patients' preference for life-extending care did not differ according to their proximity to death ($P = .31$), as indicated in Figure 1. Another cross-sectional analysis that examined the percentage of patients who preferred life-extending care stratified according to Karnofsky score revealed no differences ($P = .20$, data not shown).

Preferences, Prognostic Understanding, and Advance Care Planning

Most advanced cancer patients wanted information about their prognosis (73.3%), but only a minority (37.5%) acknowledged that they were terminally ill. There was no difference in patients' desire for prognostic information according to their treatment preferences (68.7% vs 75.1%; $P = .26$), but patients who preferred life-extending treatments were less likely to report that their illness was terminal (23.4% vs 42.6%; $P = .003$) or that they had had an EOL discussion with a physician (20.7% vs 44.4%; $P = .0002$).

Site-Specific Differences in Patients' EOL Care

EOL care in patients with cancer varied by treatment site, as indicated in Table 2. Patients who were treated at Yale Cancer Center were more likely to undergo intensive care compared with patients at Parkland Hospital (odds ratio [OR], 3.14; 95% confidence interval [CI], 1.16-8.47). In contrast, no patients with cancer at New Hampshire Oncology-Hematology received aggressive medical care in the final week of life (thus preventing calculation of an OR or a P value for this treatment site). Patients who were treated at Yale Cancer Center also were less likely to receive hospice services in the final week of life compared with patients who were treated at Parkland Hospital (OR, 0.52; 95% CI, 0.29-0.92).

End-of-Life Medical Care

Patients who preferred life-extending therapies at baseline were more likely to receive intensive care (adjusted OR [AOR], 2.91; 95% CI, 1.09-7.72) and were less likely to receive hospice services (AOR, 0.45; 95% CI, 0.26-0.78) at the EOL, compared with patients who wanted comfort care, as indicated in Table 3. In contrast, treatment site was not associated significantly with patients' EOL medical care after analyses were adjusted for patients' preferences, race/ethnicity, communication with physicians, and terminal illness acknowledgment. In adjusted analyses, black patients were more likely to receive intensive care at the EOL. Cancer patients who reported having had an EOL discussion with their physician were less likely to receive intensive care (AOR, 0.21; 95% CI, 0.05-0.94), whereas patients who understood that their illness was terminal were more likely to receive hospice services at the EOL (AOR, 2.08; 95% CI, 1.23-3.53) and were less likely to die in an inpatient facility or at home without hospice services (AOR, 0.51; 95% CI 0.28-0.91).

DISCUSSION

The current results suggest that treatment preferences among patients with advanced cancer may be more important determinants of EOL care than previously was recognized. In this

study, we observed site-specific differences in the treatment preferences and medical care of patients with cancer in the final week of life. However, patients' treatment preferences, communication with physicians, and terminal illness acknowledgment were more significant predictors of patients' EOL care than treatment site. In this study, patients who preferred life-extending care were nearly 3 times more likely to receive intensive care and were half as likely to receive hospice services at the EOL. These results challenge previous research suggesting that the regional supply of healthcare resources is the most powerful determinant of patients' EOL care.¹⁻⁴

Our findings are consistent with 2 prior analyses from the SUPPORT study, which was conducted between 1989 and 1993.^{6,16} In a study of hospitalized cancer patients with terminal illness, Weeks et al⁶ demonstrated that patients who preferred life-extending therapies were 1.6 times more likely to undergo CPR, to die on a ventilator, or to be readmitted to the hospital later. Similarly, Phillips et al¹⁶ reported that patients' preferences varied by treatment site but that patients who wanted CPR received more therapeutic interventions (ie, intravenous antibiotics). Our current study, which was conducted over a decade later, extends those results by examining associations between patients' preferences and the use of hospice services.

In the current study, we observed significant differences in patients' preferences and EOL care based on where they were treated. For example, patients at Yale Cancer Center were twice as likely to prefer life-extending therapy compared with patients at New Hampshire Oncology-Hematology (38.7% vs 19.7%). Similarly, 12% of patients at Yale Cancer Center received intensive care at the EOL compared with 0% at New Hampshire Oncology-Hematology. The site-specific variations in patient preferences and EOL medical care may reflect differences in institutional-level, provider-level, or patient-level factors. For example, the hospitals affiliated with New Hampshire Oncology-Hematology have fewer ICU beds and medical specialists compared with Yale Cancer Center. Oncology providers at Yale Cancer Center also may have different preferences regarding the use of aggressive care at the EOL compared with providers at New Hampshire Oncology-Hematology; eg, they may be more likely to enroll patients in phase 1 clinical trials instead of hospice. There also may be differences in urban, suburban, and rural patients' preferences and expectations for EOL care. Several studies have documented disparities in access to cancer care in rural areas compared with urban environments, although others have described higher rates of fatalism in rural settings in which patients may be more familiar with death and less likely to use technology to intervene with the "natural course of events."^{17,18} Nevertheless, in the current study, patient-level factors (eg, treatment preferences, terminal illness acknowledgment) and provider-level factors (EOL discussions) were stronger predictors of EOL care than treatment site. Future research is needed to determine how physicians' attitudes (eg, toward palliative care), clinical encounters (eg, EOL discussions, continuity of care),^{8,19} and other healthcare structural factors (eg, hospital norms, density of medical specialists)^{1-4,20} interact with patients' preferences to influence EOL care.

Consistent with prior studies, patients' preferences were influenced more by their sociodemographic characteristics (eg, age, sex, race) and prognostic understanding than by their actual health state (eg, performance status, number of medical comorbidities, quality of life, or survival).¹⁴ In the current study, 73.3% of patients with advanced cancer wanted to know how long they had to live, but patients who preferred life-extending therapies were significantly less likely to recall an EOL discussion with a physician or to understand that their illness was terminal. These results suggest that patients may not be receiving adequate information to make informed decisions about their EOL care.

The current study has several limitations worth noting. Most noteworthy, we had only had 1 assessment of patients' treatment preferences obtained at baseline. Although we lacked longitudinal data on patients' preferences, we performed a cross-sectional analysis to examine patients' treatment preferences by their proximity to death from enrollment and did not detect any differences in the percentage of patients who wanted life-extending care as their health deteriorated. These results suggest that patients' preferences in this sample may have been more stable over the last few months of life than previously described.²¹ Future research that includes repeated assessments of terminally ill cancer patients' preferences over time will be needed to confirm these results. Another limitation is that our study did not provide information on how patients' preferences are formulated, their understanding of what life-prolonging procedures entail, or how these impressions translate into their EOL care. Finally, we had limited information about the characteristics of the local healthcare system at individual treatment sites (eg, the density of hospital beds per capita). Future research is needed to understand how patients' preferences influence the decision-making process that leads to the receipt of their preferred care over time while also factoring in larger healthcare system characteristics (eg, Medicare reimbursement policies; the density of hospice services, palliative care providers, and medical specialists; and the number of clinical trials available).

Despite these limitations, our study has many strengths. Previous studies have concluded that differences in patients' EOL care are driven by regional differences in the supply of medical services without directly examining the influence of patients' treatment preferences.^{1,3,4} One cross-sectional study surveyed Medicare recipients about their treatment preferences using hypothetical health scenarios to examine whether patients' treatment preferences explained regional differences in Medicare spending.² Although the negative findings in that study were provocative, there is limited evidence to support the idea that the decisions individuals make while they are healthy predict their preferences for care when death is imminent. In contrast, our study included interviews with patients who had advanced cancer in diverse settings (academic medical centers, a county hospital, and a community oncology practice) who were confronting the actual EOL decisions we asked them about. This may increase the generalizability and utility of our findings.

In summary, the current study demonstrated that treatment preferences of patients with advanced cancer exert an important influence on the medical care that patients receive near death. In this study, patients who wanted life-prolonging care were nearly 3 times more likely to receive intensive care in the final week of life, and they were 50% less likely to receive hospice services. Although others have argued that improving EOL care will require macro-level structural changes in the way that healthcare is delivered, the results of the current study suggest that altering the physician-patient level factors that influence patients' preferences may offer more promise for enhancing care in the final weeks of life than previously believed. Given the significant influence of patients' preferences on their EOL care, future research is needed to determine which factors have the greater influence on those preferences.

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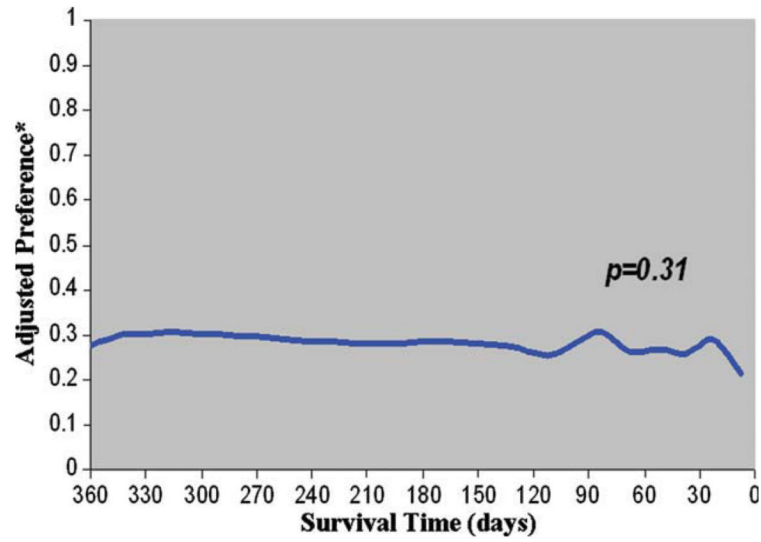


Figure 1. Illustrated are patients' preferences for life-extending therapy by survival. Preference was adjusted for end-of-life discussion, Yale Cancer Center, and New Hampshire Oncology-Hematology.

Table 1

Participant Characteristics by Preference for Life-Extending Therapy

Baseline Characteristic	No. of Patients (%)			P
	Total	Yes	No	
Overall	301 (100)	3 (27.6)	218 (72.4)	
Men	158 (52.7)	53 (63.9)	105 (48.4)	.02 ^a
Age, y				.01 ^a
<50	83 (27.6)	31 (37.4)	42 (19.3)	
50-59	79 (26.3)	17 (20.5)	62 (28.4)	
60-69	85 (28.2)	20 (24.1)	65 (29.8)	
>70	63 (20.9)	15 (18)	48 (22)	
Race/ethnicity				.03 ^a
White, non-Hispanic	187 (62.3)	43 (51.8)	144 (66.4)	
Black, non-Hispanic	58 (19.3)	24 (28.9)	34 (15.7)	
Hispanic	50 (16.7)	14 (16.9)	36 (16.6)	
Asian/other	5 (1.7)	2 (2.4)	3 (1.4)	
Married	167 (55.5)	48 (57.8)	119 (54.6)	.61
Education				.86
High school	157 (52.2)	44 (53)	113 (51.8)	
College or graduate school	144 (47.8)	39 (47)	105 (48.2)	
Health insurance	173 (58.6)	51 (63)	122 (57)	.35
Positive religious coping	168 (59.2)	51 (30.4)	117 (69.6)	.32
Cancer type				.36
Breast	34 (11.5)	5 (6)	29 (13.7)	
Gastrointestinal	107 (35.6)	32 (38.6)	75 (34.4)	
Lung	60 (20.3)	17 (20.5)	43 (20.3)	
Other ^b	100 (33.2)	29 (34.9)	71 (32.6)	
Treatment site				.07
Yale Cancer Center	75 (24.9)	29 (34.9)	46 (21.1)	
New Hampshire Oncology-Hematology	66 (21.9)	13 (15.7)	53 (24.3)	
Simmons Comprehensive Cancer Center	33 (11)	9 (10.8)	24 (11)	
Parkland Hospital	128 (42.5)	33 (39.8)	95 (43.6)	
Communication and preferences				
Desire for prognostic information	220 (73.3)	57 (68.7)	163 (75.1)	.26
Close relationship with physician	207 (68.8)	55 (66.3)	152 (69.7)	.56
Understands illness is terminal	110 (37.5)	18 (23.4)	92 (42.6)	.003 ^a
End-of-life discussion with physician	113 (37.9)	17 (20.7)	96 (44.4)	.0002 ^a
Overall health status: Mean ± SD				
Karnofsky score ^c	62.2±18.0	64.1±4.5	61.5±19.1	.22

Baseline Characteristic	Total	No. of Patients (%)		<i>P</i>
		Life-Extending Therapy		
		Yes	No	
Charlson index ^d	8.4±2.8	8.2±3.1	8.5±2.7	.42
Quality of life ^e	6.8±1.6	6.9±1.5	6.6±1.6	.69
Overall median survival [IQR], mo	4.5 [2.0-9.1]	5.2 [2.4-9.4]	4.2 [1.7-9.1]	.60

SD indicates standard deviation; IQR, interquartile range.

^aSignificant *P* value.

^bThe remaining patients had cancer types that represented <5% of the sample.

^cThe Karnofsky score is a measure of functional status that is predictive of survival in which 0 indicates dead, and 100 indicates perfect health.

^dThe Charlson comorbidity index is a measure of comorbid illness in which higher numbers indicate greater burden.

^eMcGill Quality-of-Life Questionnaire items are rated on a scale from 0 (desirable) to 10 (undesirable).

Table 2

Associations Between Treatment Site and End-of-Life Medical Care

Treatment Site	Intensive Care ^a			Hospice Services ^b			Other EOL Care ^c					
	No./Total	%	OR	95% CI	No./Total	%	OR	95% CI	No./Total	%	OR	95% CI
Yale Cancer Center	9/75	12.0	3.14	1.16-8.47 ^d	37/75	49.3	0.52	0.29-0.92 ^d	29/75	38.7	0.63	0.34-1.15
Simmons Comprehensive Cancer Center	3/33	9.1	2.30	0.58-9.16	20/33	60.6	0.64	0.29-1.38	10/33	36.4	0.69	0.31-1.55
New Hampshire Oncology-Hematology	0/66	0	-	-	50/66	75.8	1.66	0.85-3.24	16/66	24.2	1.24	0.63-2.45
Parkland Hospital	8/128	6.3	Ref	Ref	84/128	65.6	Ref	Ref	36/128	28.1	Ref	Ref

EOL indicates end of life; OR, odds ratio; CI, confidence interval; Ref, referent category.

^aDefined as the receipt of cardiopulmonary resuscitation and/or mechanical ventilation followed by death in an intensive care unit.

^bIncluded patients who died either at home while receiving hospice services or in an inpatient hospice (n=40/191).

^cOther EOL care included inpatient hospital care (n=58; 5 patients received care in an intensive care unit and then were transferred to a hospital floor before death), home care without hospice services (n=20), and inpatient nursing home care (n=13).

^d $p < .05$ (significant).

^eNo cases.

Table 3
Associations Between Patients' Treatment Preferences, Treatment Site, Communication, and End-of-Life Care

Predictors	Intensive Care ^a			Hospice Services ^b			Other EOL Care ^c			
	OR	95% CI	AOR ^d	OR	95% CI	AOR ^d	OR	95% CI	AOR ^d	95% CI
Preference for life-extending care	4.42	1.74-11.24 ^e	2.91	1.09-7.72 ^f	0.38	0.23-0.64 ^g	0.45	0.26-0.78 ^e	1.74	1.02-2.96 ^f
Treatment site										
Yale Cancer Center	3.14	1.16-8.47 ^f	<i>h</i>	<i>h</i>	0.52	0.29-0.92 ^f	<i>h</i>	<i>h</i>	1.59	0.87-2.92
New Hampshire Oncology-Hematology	<i>i</i>	<i>i</i>	<i>i</i>	<i>i</i>	1.66	0.85-3.24	<i>h</i>	<i>h</i>	0.81	0.41-1.60
Simmons Comprehensive Cancer Center	2.30	0.58-9.16	<i>h</i>	<i>h</i>	0.64	0.29-1.38	<i>h</i>	<i>h</i>	1.44	0.64-3.24
Parkland Hospital	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
EOL discussion	0.17	0.04-0.73 ^f	0.21	0.05-0.94 ^f	2.36	1.41-3.93 ^g	<i>h</i>	<i>h</i>	0.58	0.34-0.98 ^f
Understands illness is terminal	0.57	0.20-1.63	<i>h</i>	<i>h</i>	2.33	1.38-3.91 ^g	2.08	1.23-3.53 ^e	0.46	0.26-0.79 ^e
Age	0.97	0.93-1.01	<i>h</i>	<i>h</i>	0.69	0.36-1.32	<i>h</i>	<i>h</i>	0.99	0.98-1.02
Black race	3.84	1.51-9.77 ^e	3.29	1.23-8.77 ^f	0.72	0.40-1.31	<i>h</i>	<i>h</i>	0.82	0.43-1.54

EOL indicates end of life; OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio; Ref, referent category.

^aDefined as the receipt of cardiopulmonary resuscitation and/or mechanical ventilation followed by death in an intensive care unit.

^bIncludes patients who died either at home while receiving hospice services or in an inpatient hospice (n=40/191).

^cOther EOL care included inpatient hospital care (n=58; 5 patients received care in an intensive care unit and then were transferred to a hospital floor before death), home care without hospice services (n=20), and inpatient nursing home care (n=13).

^dConfounds that were examined included age, sex, race, treatment site, terminal illness acknowledgement, and EOL discussion. Confounds were included in the models if they were associated ($P < .20$) with both a preference for life-extending care and any EOL outcome and were retained in the multivariate models if significant ($P < .05$). The model for estimating the association between patients' preferences and intensive care included Yale Cancer Center, EOL discussion with physician, and black race/ethnicity. The model for estimating the association between patients' preferences and hospice services included Yale Cancer Center, EOL discussion with physician, and terminal illness acknowledgement. The model for estimating the association between patients' preferences and other EOL care included EOL discussion and terminal illness acknowledgement.

^e $P < .01$ (significant).

^f $P < .05$ (significant).

^g $P < .001$ (significant).

^hNot significant.

ⁱNo events at this site.