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Goals-of-Care Consultation Associated with Increased Hospice Enrollment Among Propensity-Matched Cohorts of Seriously Ill African American and White Patients

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Abstract

Context—African Americans are less likely to receive hospice care and more likely to receive aggressive end-of-life care than Whites. Little is known about how palliative care consultation to discuss goals-of-care (hereafter “PCC”) is associated with hospice enrollment by race.

Objectives—To compare enrollment in hospice at discharge between propensity-matched cohorts of African Americans with and without PCC, and Whites with and without PCC.

Methods—Secondary analysis of a retrospective cohort study at a high-acuity hospital; employing stratified propensity-score matching for 35,154 African Americans and Whites age 18+ admitted for conditions other than childbirth or rehabilitation, who were not hospitalized at end of study, and didn’t die during index hospitalization (hospitalization during which first PCC occurred).

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Results—Compared to African Americans without PCC, African Americans with PCC were 15 times more likely to be discharged to hospice from index hospitalization (2.4% vs. 36.5%, $P < 0.0001$). Compared to White patients without PCC, White patients with PCC were 14 times more likely to be discharged to hospice from index hospitalization (3.0% vs. 42.7%, $P < 0.0001$).

Conclusion—In propensity-matched cohorts of seriously ill patients, palliative care consultation to discuss goals-of-care was associated with significant increases in hospice enrollment at discharge among both African Americans and Whites. Research is needed to understand how PCC influences decision-making by race, how PCC is associated with post-discharge hospice outcomes such as disenrollment and hospice length of stay, and if PCC is associated with improving racial disparities in end-of-life care.

Keywords

Palliative care; hospice care; healthcare disparities; advance care planning; patient care planning; decision-making process; terminal care

INTRODUCTION

In the United States, African Americans are less likely than Whites to have advance care planning discussions (1) despite evidence that patient-provider conversations about goals-of-care are associated with preference-concordant end-of-life care and less aggressive treatments (2, 3). Aggressive end-of-life care is associated with family perceptions of lower quality care (4, 5), greater decision regret (6), and lower patient quality-of-life (7). Communication disparities and differences in discussion effectiveness may help explain why African Americans are more likely than Whites to receive aggressive end-of-life care and die in hospitals, and less likely to receive comfort-oriented hospice care (1, 8). Hospice offers holistic illness management and the possibility of higher quality-of-life and satisfaction near end-of-life (9–13), yet a significantly lower proportion of African Americans die on hospice compared to Whites (14). Evidence suggests lack of knowledge about hospice strongly contributes to African American underutilization of hospice (15, 16). Palliative care consultations to discuss goals-of-care (“PCC”) can improve communication about prognosis and care options such as hospice (17), with earlier consultations resulting in significantly longer hospice length of stay (18). However, despite the National Academy of Medicine’s recommendation to implement palliative care and reduce racial disparities in end-of-life care (3), little is known about PCC associations with hospice use by race. The purpose of this study was to compare enrollment in hospice at discharge between propensity-matched cohorts of seriously ill African Americans with and without PCC and seriously ill Whites with and without PCC to understand if PCC is associated with increased hospice use within racial groups.

METHODS

Setting

This secondary analysis of a retrospective cohort study employed medical records data from a large, urban, high-acuity academic medical system in the Northeast United States (19). The medical center serves a diverse area composed of 46% African Americans, 36% Whites, 9%

Asians, and 6% Hispanics and receives referrals and transfer patients from suburban areas (20). Over half of families in the service area live in poverty (20). The center's palliative care team is well-established and predominantly works as a consultation service (19). Physicians, advance practice nurses, registered nurses, social workers, a pharmacist, and a chaplain make up the team. Intensive care unit teams request one-third of all palliative care consultations (19). The parent study, which analyzed outcomes of 41,363 seriously ill hospitalized patients using propensity score matching, found PCC was associated with reduced future acute care costs and utilization resulting in savings of over \$6000 per patient, but did not assess outcomes by race or analyze hospice enrollment (19). Although race was not a factor in whether or not a patient received PCC in the parent study (19), race may be a factor in cost and utilization outcomes associated with PCC, warranting its study. In our study, supplementary Medicaid data was pulled from electronic medical records.

Participants

Patients were included if they were 18 years or older; self-identified as African American or White; were admitted between July 1, 2014 and October 31, 2016 for conditions other than childbirth or rehabilitation; were not hospitalized at the end of the study period; and did not die during index hospitalization, the admission during which patients first received PCC. The hospital's palliative care registry, which includes demographic and clinical information (e.g., the reason for consultation), was used to identify all patients who received a palliative care consultation during the study period. Patients who received a consult specifically to discuss goals-of-care were included. Patients who received a consult for reasons other than goals-of-care were excluded (e.g., exclusively pain management).

Ethics

This study was approved by the University of Pennsylvania institutional review board (August 21, 2018; authorized by 45 CFR 46.104, category #4) and followed strict procedures to ensure patient data privacy, security, and ethics.

Analysis

The independent variable is PCC as recorded in the palliative care registry according to patient self-identified racial group (African American, White). All hospital admissions during the study period were placed into one of four groups: (1) African Americans with PCC, (2) African Americans without PCC, (3) Whites with PCC, and (4) Whites without PCC. Based on data available in the parent study, the outcome is patient discharge to hospice from index hospitalization. The sample size ($N = 35,154$) met requirements for a statistical power of 0.91 and an alpha level of 0.01 to detect an effect size of 0.136. There was no missing data in our study, as the parent study had previously excluded 0.4% of patients in its sample due to missing data (representing <5% of patients).

At baseline, before propensity score matching, African Americans and Whites in PCC and Non-PCC groups differed significantly (Table 1). To account for these differences and reduce bias, we used a two-step matching process, per race, to make the PCC and Non-PCC groups similar in their mean propensity for having had PCC (21). First, we used logistic regression analysis to identify factors associated with the likelihood of a patient receiving

PCC (Table 2). These variables included: age, gender, Medicaid status, primary diagnosis, All Patient Refined (APR)-DRG Severity of Illness (the extent of physiological decompensation) at time of index hospitalization discharge, APR-DRG Risk of Mortality (the likelihood of dying) at time of index hospitalization discharge, intensive care during index hospitalization, intensive care duration greater than six days during index hospitalization, oncology services during index hospitalization, acute care 30 days before index hospitalization, and acute care costs accumulated during index hospitalization (defined as the impact of \$1,000 to represent acute care utilization and show the expected increase in getting PCC) (19).

The APR-DRG variables have four subcategories (minor, moderate, major, extreme) that are assigned systematically at discharge based on diagnoses and procedures coded for billing during hospitalization (19, 22). These variables depend on the patient's underlying acute or chronic condition and comorbidity interactions (19, 22). The presence and interaction of multiple serious diseases characterize high Severity of Illness and high Risk of Mortality (23). As a secondary analysis, our study was limited to using these available measures to indicate illness severity and comorbidity, however a 2018 study found APR-DRG Risk of Mortality and Severity of Illness are better predictors of in-hospital mortality than the Charlson Comorbidity Index (24), making them dependable proxies for illness severity and enabling effective severity adjustment. Because we could not account for socioeconomic variables such as education and health literacy that were unavailable in the dataset, we used Medicaid insurance status as a proxy for socioeconomic status (25–27).

The logistic regression model of African American PCC and Non-PCC patients had a C statistic of 0.907, indicating adequate model fit. The model of White PCC and Non-PCC patients had a C statistic of 0.901, also indicating adequate model fit.

Preliminary propensity models showed that many variables were significant in predicting which patients received PCC. To maximize the quality of matching and prevent substantial data loss, we followed the subclassification or stratification approach suggested by Rosenbaum and Rubin (28) and used stratified propensity score matching, an established method in health services research (19, 29–31). Based on existing methodological discourse, no propensity score matching method is a priori superior to others (32), however this method has been shown to reduce 90–95% of bias (28, 33). When compared to traditional propensity score matching, stratified matching has been found to produce similar results (31, 34).

After developing logistic regression models by race, we created propensity scores for each patient using output from the logistic regression models, by race. To account for possible inherent differences and nonrandom assignment of variables in the PCC and Non-PCC groups, we then created stratified propensity score models, by race, by ranking and stratifying the scores into six mutually exclusive propensity tiers, from highest to lowest, to identify which patients were most likely to have received PCC (Table 3). All patients were assigned to a tier. For each race's model, patients in the PCC and Non-PCC groups were similar in terms of their propensity scores for having had PCC (Table 3), enabling rigorous comparison of PCC patients to Non-PCC patients within tiers, within races (21, 35). With this method, PCC and Non-PCC groups do not need to match on each individual variable.

Instead, confounding variables are accounted for through logistic regression to predict PCC. To reduce bias, the method's goal is for top tiers to have similar mean propensities for PCC. We then used a Cochran-Mantel-Haenszel test to analyze discharge to hospice for patients in the two highest propensity tiers (blended), by race, because these patients were most likely to have received PCC (Table 4). The lowest propensity tiers had too few PCC cases, so we did not analyze them. Statistical significance was taken at the 0.05 level.

RESULTS

Our sample included 11,158 African American patients (PCC = 383; No PCC = 10,777) and 23,994 White patients (PCC = 814; No PCC = 23,180) (N = 35,154). As shown in Table 1, both groups differed significantly at baseline before matching across every variable except gender and use of Medicaid. At baseline, Whites with and without PCC did not differ in having Medicaid ($P=0.48$), however African Americans with and without PCC differed (PCC = 21.7% with Medicaid; No PCC = 32% with Medicaid; $P<0.0001$). After matching, patients across racial groups did not differ in their propensity for having had PCC (Table 3).

Compared to African American patients without PCC, African American patients with PCC were 15 times more likely to be discharged to hospice from index hospitalization (top two propensity tiers blended, 2.4% vs. 36.5%, $P < 0.0001$) (Table 4). Compared to White patients without PCC, White patients with PCC were 14 times more likely to be discharged to hospice from index hospitalization (top two propensity tiers blended, 3.0% vs. 42.7%, $P < 0.0001$).

DISCUSSION

This is the first known study to assess hospice use associated with PCC by race. Our study demonstrated a large and significant impact of PCC on hospice enrollment in propensity-matched cohorts of seriously ill White patients and seriously ill African American patients.

Dramatic increases in patient discharge to hospice among both racial groups is important given the well-documented benefits of hospice care (36, 37). In a recent propensity-score matched study of heart failure patients with past history of hospitalization, for example, authors found that in the six months following a second hospitalization discharge, patients who enrolled in hospice had longer median survival and lower acute care use, including fewer emergency department visits, hospital days, and ICU stays; and were less likely to die in the hospital—all evidence that suggests fewer disruptive transitions in care and higher quality of life near death (38). In addition to evidence of hospice patients living longer than similarly ill patients who do not receive hospice (39, 40), hospice has been found to be associated with patients having fewer unmet needs, higher quality of care, better quality of dying, improved emotional support for patient or family, and better overall satisfaction among families (3, 41–43). Hospice also benefits health systems and payers by reducing unnecessary acute care use and related costs (2, 44). Palliative care consultations to discuss goals-of-care are similarly associated with cost reductions (2, 19, 45), likely partly due in part to increased use of hospice.

Even though our study found PCC was associated with hospice enrollment increases in both racial groups, absolute enrollment still differed among races. More research is needed to understand if PCC helps reduce racial disparities in end-of-life care after discharge to hospice (3), including disparities in hospital readmission, disenrollment from hospice, and the number of care transitions hospice patients experience (46–48). A recent study showed about half of informal caregivers of hospice patients had unmet information needs related to hospice care (49) and that inadequate understanding of hospice among family caregivers is a cause of hospitalization after hospice enrollment (50). Research is also needed to understand how PCC is associated with future hospice enrollment, duration of enrollment, future acute care use, and place of death—and if racial differences exist.

In our study, hospice increases were greater among African Americans, a population that has historically demonstrated lower use of hospice care (51). Increases in hospice use among African Americans may help reduce racial differences in end-of-life pain management, quality of care, perceptions and concerns about care quality, and other outcomes (52). Although distrust is often cited as a reason for African Americans choosing life-sustaining treatments over comfort care, a recent systematic review found trust in healthcare providers and advance care planning outcomes did not differ between African Americans and Whites engaged in advance care planning (53). Coupled with our results, this finding suggests improved interpersonal communication between clinicians and patients, which occurs during palliative care consultations (54), may be driving increased hospice use across races and should be investigated in studies aiming to improve racial disparities in hospice outcomes (46, 55).

Our study has several limitations. First, as is the case with all propensity-score studies, our models cannot account for unmeasured or unknown confounding variables (19, 56). We were unable to control for income, insurance, education, health literacy, religiosity, specific comorbidities, or duration of survival because these variables were not available in the dataset. Socioeconomic variables, such as income and education, which have been found to help explain differences in advance care planning in African Americans (53), were not available in the dataset and may have contributed. Compared to Whites, African Americans endure significant systematic disadvantages resulting in disproportionate and poor economic resources to higher unemployment and lower incomes, which impact health, health literacy, and access to quality care (53, 57). Less-educated patients in general have been found to have lower levels of health literacy (53, 58), which can influence how a patient understands, recalls, and applies information exchanged during healthcare encounters (58, 59). To account for this limitation, we used Medicaid status as a proxy. Still, unmeasured variables may be distributed differently in patients who received PCC and those who did not (19). Although our study controlled for severity of illness and risk of mortality using accepted variables (24), there are limitations to using secondary measures. As such, severity adjustment may be imperfect, possibly contributing to residual confounding.

Second, our analysis did not include hospice use among patients who enrolled in hospice after discharge. Third, PCC and Non-PCC patients were compared based on discharge from index admission, not last discharge during the study period. Propensity score matching should reduce any potential bias due to the distinction, but as a secondary analysis it is not

possible to know if differences exist. Fourth, our study was conducted in a system with racially diverse patients and an experienced palliative care team. The size of the effect may vary in other settings. Finally, our study only analyzed African American and White patients. Evidence suggests Hispanic patients and Asian American patients also use hospice less than White patients, although enrollment rates are increasing in these groups (60). Future research on PCC and hospice enrollment among all racial/ethnic groups is needed (46).

Our findings provide evidence that PCC is associated with increased hospice use across races and that goals-of-care communication in PCC, rather than race alone, help determine end-of-life outcomes (6, 61). Clinicians should engage all patients in culturally-sensitive PCC discussions to clarify care preferences, enable informed decision-making, and improve understanding of how hospice might align with personal goals. Providing care consistent with patient values and goals enables the delivery of high-quality care (3, 62). Policies and practices that support goals-of-care discussions are needed to better meet the needs of vulnerable patients across racial groups.

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Table 1. Description of African American patients with and without palliative care consultation (PCC), and White patients with and without PCC before stratified propensity score matching

	Total N = 35,154	African Americans Non-PCC	African Americans with PCC	P value	Whites Non-PCC	Whites with PCC	P value
Age (years)	18–39	5,739 (16%)	2385 (22.1%)	<.0001	N = 23,180	N = 814	<.0001
	40–45	2,419 (7%)	980 (9.1%)		3280 (14.2%)	55 (6.8%)	
	46–50	2,642 (8%)	953 (8.8%)		1405 (6.1%)	30 (3.7%)	
	51–55	3,614 (10%)	1215 (11.3%)		1639 (7.1%)	29 (3.6%)	
	56–60	4,338 (12%)	1330 (12.3%)		2294 (9.9%)	60 (7.4%)	
	61–65	4,320 (12%)	1165 (10.8%)		2854 (12.3%)	99 (12.2%)	
	66–70	4,223 (12%)	955 (8.9%)		2987 (12.9%)	115 (14.1%)	
	71–75	3,199 (9%)	668 (6.2%)		3093 (13.3%)	124 (15.2%)	
Gender	>75	4,660 (13%)	1126 (10.5%)	.2836	2386 (10.3%)	104 (12.8%)	0.80
	Male	17,286 (49%)	4543 (42.2%)		3242 (14.0%)	198 (24.3%)	
	Female	17,868 (51%)	6234 (57.8%)		12148 (52.4%)	423 (52.0%)	
Medicaid	Yes	4,819 (14%)	3454 (32.0%)	<.0001	11032 (47.6%)	391 (48.0%)	0.48
	No	30,335 (86%)	7323 (68.0%)		1243 (5.4%)	39 (4.8%)	
Primary Diagnosis	Cancer	6,955 (19.8%)	1063 (9.9%)	<.0001	21937 (94.6%)	775 (95.2%)	<.0001
	Cardiovascular disorder / Heart Failure	6,430 (18.3%)	1774 (16.5%)		5472 (23.6%)	317 (38.9%)	
	Endocrine disorder	1,942 (5.5%)	902 (8.4%)		4444 (19.2%)	136 (16.7%)	
	GI disorder	4,120 (11.7%)	1147 (10.6%)		1014 (4.4%)	18 (2.2%)	
	Gynecologic or urologic disorder	2,393 (6.8%)	1086 (10.1%)		2872 (12.4%)	72 (8.9%)	
	Infectious disease and Sepsis	2,950 (8.4%)	1227 (11.4%)		1267 (5.5%)	23 (2.8%)	
	Neurologic disorder	3,508 (10%)	1204 (11.2%)		1565 (6.8%)	95 (11.7%)	
	Respiratory disorder	1,394 (4.0%)	493 (4.6%)		2227 (9.6%)	46 (5.7%)	
	Other	5,462 (15.5%)	1881 (17.5%)		819 (3.5%)	59 (7.3%)	
					3500 (15.1%)	48 (5.9%)	

		Total N = 35,154	African Americans Non-PCC	African Americans with PCC	P value	Whites Non-PCC	Whites with PCC	P value
APR-DRG Severity of Illness	Minor	8,044 (22.9%)	N = 10,777	N = 383	<.0001	N = 23,180	N = 814	<.0001
	Moderate	13,876 (39.5%)	2343 (21.7%)	6 (1.6%)		5680 (24.5%)	15 (1.8%)	
	Major	9,912 (28.2%)	4446 (41.3%)	36 (9.4%)		9316 (40.2%)	78 (9.6%)	
	Severe	3,322 (9.4%)	3140 (29.1%)	167 (43.6%)		6270 (27.1%)	335 (41.2%)	
APR-DRG Risk of Mortality	Minor	15,914 (45.3%)	848 (7.9%)	174 (45.4%)	<.0001	1914 (8.3%)	386 (47.4%)	<.0001
	Moderate	10,112 (28.8%)	5142 (47.7%)	11 (2.9%)		10741 (46.3%)	20 (2.5%)	
	Major	6,637 (18.9%)	3072 (28.5%)	50 (13.1%)		6854 (29.6%)	136 (16.7%)	
	Severe	2,491 (7.1%)	1940 (18.0%)	179 (46.7%)		4177 (18.0%)	341 (41.9%)	
Acute care hospitalization 30 days prior to index hospitalization	Yes	653 (1.9%)	623 (5.8%)	143 (37.3%)	<.0001	1408 (6.1%)	317 (38.9%)	<.0001
	No	34,501 (98.1%)	127 (1.2%)	80 (20.9%)		240 (1.0%)	206 (25.3%)	
ICU care during index admission	Yes	11,448 (32.6%)	10650 (98.8%)	303 (79.1%)	<.0001	22940 (99.0%)	608 (74.7%)	<.0001
	No	23,706 (67.4%)	2792 (25.9%)	197 (51.4%)		8025 (34.6%)	434 (53.3%)	
ICU care > 6 days during index admission	Yes	2,637 (7.5%)	7985 (74.1%)	186 (48.6%)	<.0001	15155 (65.4%)	380 (46.7%)	<.0001
	No	32,517 (92.5%)	624 (5.8%)	104 (27.2%)		1683 (7.3%)	226 (27.8%)	
Visited by Oncology service during index admission (1 st or 2 nd service)	Yes	2,984 (8.5%)	10153 (94.2%)	279 (72.8%)	<.0001	21497 (92.7%)	588 (72.2%)	<.0001
	No	32,170 (91.5%)	456 (4.2%)	77 (20.1%)		2188 (9.4%)	263 (32.3%)	
DNR documented during index admission	Yes	1,425 (4.1%)	10321 (95.8%)	306 (79.9%)	<.0001	20992 (90.6%)	551 (67.7%)	<.0001
	No	33,729 (95.9%)	242 (2.2%)	172 (44.9%)		594 (2.6%)	417 (51.2%)	
Mean number of days hospitalized during index admission (SD)		5.96 (7.63)	10535 (97.8%)	211 (55.1%)	<.0001	22586 (97.4%)	397 (48.8%)	<.0001
Median number of days hospitalized during index admission (IQR)		4.0 (2.0–7.0)	17.05 (19.5)	<.0001	6.29 (7.67)	16.53 (19.06)	<.0001	<.0001
Mean number of ICU days during index admission (SD)		1.18 (4.26)	10.0 (6.0–20.0)	<.0001	4.0 (2.0–7.0)	10.0 (6.0–20.0)	<.0001	<.0001
Median number of ICU days during index admission (IQR)		0 (0–0)	6.03 (12.70)	<.0001	1.45 (4.00)	6.36 (13.78)	<.0001	<.0001
Mean direct acute care costs during index admission (SD)		\$15665 (\$22667)	1.0 (0–6.0)	<.0001	0 (0–1.0)	1.0 (0–7.0)	<.0001	<.0001
Median direct acute care costs during index admission (IQR)		\$9,723 (\$5,898–\$15,641)	\$35982 (\$49024)	<.0001	\$19583 (\$25209)	\$40126 (\$59607)	<.0001	<.0001
			\$18,578 (\$10,811–\$38,119)	<.0001	\$12,114 (\$7,639–\$21,373)	\$20,017 (\$10,455–\$41,445)	<.0001	<.0001

	Total N = 35,154	African Americans Non-PCC N = 10,777 60.1%	African Americans with PCC N = 383 -	P value	Whites Non-PCC N = 23,180 67.7%	Whites with PCC N = 814 0.01	P value
Changed goals-of-care during PCC index admission (% yes)	n/a			n/a			

Significance tests for the percentage variables involved a Chi-squared test; significance tests for parametric continuous variables involved a t test; significance tests for non-parametric continuous variables involved a Kruskal-Wallis non-parametric test of ranks.

Logistic Regression Analysis of Likelihood of Receiving Palliative Care Consult (PCC)

Table 2.

		African American patients		White patients	
Parameter		Odds Ratio	95% Confidence Interval for Odds Ratio	Odds Ratio	95% Confidence Interval for Odds Ratio
Age (years)	18–39	0.201	(0.112,0.359)	0.511	(0.356,0.733)
	40–55	0.392	(0.266,0.576)	0.604	(0.461,0.79)
	56–65	0.591	(0.416,0.839)	0.789	(0.626,0.994)
	66–75	0.511	(0.364,0.717)	0.691	(0.553,0.864)
	>75	-	-	-	-
Gender	Male	0.896	(0.71,1.131)	0.732	(0.624,0.858)
	Female	-	-	-	-
Medicaid *	Yes	1.256	(0.911,1.733)	1.325	(0.912,1.925)
	No	-	-	-	-
Primary Diagnosis	Cancer	-	-	-	-
	Cardiovascular disorder and Heart Failure	0.32	(0.22,0.466)	0.365	(0.284,0.469)
	Endocrine disorder	0.226	(0.105,0.487)	0.649	(0.383,1.098)
	GI disorder	0.35	(0.213,0.573)	0.638	(0.472,0.863)
	Gynecologic or urologic disorder	0.292	(0.162,0.525)	0.461	(0.284,0.748)
	Infectious disease and Sepsis	0.33	(0.223,0.488)	0.607	(0.461,0.8)
	Neurologic disorder	0.244	(0.151,0.396)	0.463	(0.324,0.663)
	Respiratory disorder	0.469	(0.275,0.798)	1.105	(0.786,1.553)
	Other	0.311	(0.196,0.493)	0.448	(0.316,0.635)
	Minor	0.021	(0.011,0.041)	0.016	(0.01,0.026)
	Moderate	0.096	(0.065,0.143)	0.11	(0.086,0.142)
	Major	0.47	(0.35,0.633)	0.464	(0.38,0.566)
APR-DRG Risk of Mortality	Severe	-	-	-	-
	Yes	1.317	(1.018,1.704)	1.347	(1.138,1.595)
	No	-	-	-	-
ICU during index admission	Yes	1.317	(1.018,1.704)	1.347	(1.138,1.595)
	No	-	-	-	-

ICU > 9 days during index admission	Yes	No	1,589	(1,118,2,258)	1,698	(1,362,2,118)
Seen by Oncology in index admission	Yes		1,764	(1,251,2,487)	1,703	(1,394,2,08)
	No		-	-	-	-
Admitted to hospital 30 days prior	Yes		17,643	(12,064,25,801)	23,996	(18,703,30,786)
	No		-	-	-	-
Parameter (Continuous Variable)						
Direct Cost of index admission (impact per \$1,000) *			2.92*10 ⁻³	1.52*10 ⁻³	1.72*10 ⁻³	9.55*10 ⁻⁴
				.0535		0.072

Abbreviation: SE, standard error

* For every increase of \$1000 in direct costs, the estimate shows the expected increase in getting a palliative care consult.

Table 3.

Propensity Scores of Patients Most Likely to Receive Palliative Care Consultation[/] (PCC), by Race

African American patients									
Patients with Palliative Care Consult, [/] n = 383					Patients without Palliative Care Consult, [/] n = 10,777				
Tier	Propensity Score Mean	n	Min,	Max	Propensity Score Mean	n	Min,	Max	
Highest	0.303	178	0.202	0.481	0.276	1,667	0.202	0.498	
2 nd Highest	0.134	129	0.078	0.201	0.114	1,717	0.073	0.202	
White patients									
Patients with Palliative Care Consult, [/] n = 814					Patients without Palliative Care Consult, [/] n = 23,180				
Tier	Propensity Score Mean	n	Min,	Max	Propensity Score Mean	n	Min,	Max	
Highest	0.331	350	0.212	0.498	0.298	3,604	0.212	0.498	
2 nd Highest	0.153	257	0.097	0.212	0.141	3,698	0.096	0.212	

[/] Palliative care consult to discuss goals-of-care

Table 4.

Discharge to Hospice After Propensity Score Matching in Patients Most Likely to Receive Palliative Care Consultation¹ (PCC), by Race

African American patients	Propensity Group	PCC	Non-PCC	P value^b
	Highest Tier (n) ^a	n = 178	n = 1,667	
	Second Highest Tier (n) ^a	n = 129	n = 1,717	
	Top Two Tiers Blended (n) ^a	n = 307	n = 3,384	
Discharge to hospice from index admission (% yes)	Highest propensity group	30.3%	2.6%	<0.0001
	Second highest propensity group	45.0%	2.3%	
	Top Two Tiers Blended	36.5%	2.4%	
White patients	Propensity Group	PCC	Non-PCC	P value^b
	Highest Tier (n) ^a	n = 350	n = 3,604	
	Second Highest Tier (n) ^a	n = 257	n = 3,698	
	Top Two Tiers Blended (n) ^a	n = 607	n = 7,302	
Discharge to hospice from index admission (% yes)	Highest propensity group	41.1%	3.3%	<0.0001
	Second highest propensity group	44.8%	2.8%	
	Top Two Tiers Blended	42.7%	3.0%	

^a Sample sizes are consistent within each column (across all outcome variables). There were six mutually exclusive tiers, but only the top two were analyzed to show comparison among patients most likely to have received consult.

^b Significance tests involved a Cochran-Mantel-Haenszel test.

¹ Palliative care consult to discuss goals-of-care