Patterns of Palliative Care Consultation Among Elderly Patients With Cancer

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Abstract

Background: The role of palliative care has expanded over the past several decades, although the oncology-specific regional evolution of this specialty has not been characterized at the population-based level. **Methods:** This study defined the patterns of palliative care delivery using a retrospective cohort of patients with advanced cancer within the SEER-Medicare linked database. We identified 83,022 patients with metastatic breast, prostate, lung, and colorectal cancers. We studied trends between 2000 through 2009, and determined patient-level and regional-level predictors of palliative care delivery. **Results:** Palliative care consultation rates increased from 3.0% in 2000 to 12.9% in 2009, with most consultations occurring in the last 4 weeks of life (77%) in the inpatient hospital setting. The rates of palliative care delivery were highest in the West (7.6%) and lowest in the South (3.2%). The likelihood of palliative care consultation increased with decreasing numbers of regional acute care hospital beds per capita. The use of palliative care consultation increased with increasing numbers of regional physicians. The use of palliative care decreased with increasing regional Medicare expenditure with a \$1,387 difference per beneficiary between the first and fourth quartiles of palliative care use. **Conclusions:** Geographic location influences a patient's options for palliative care in the United States. Although the overall rates of palliative care are increasing, future effort should focus on improving palliative care services in regions with the least access.

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Background

Palliative care is specialized medical care for people with serious illness at any stage that focuses on optimizing patient quality of life.¹ A multidisciplinary palliative care team will often include physicians, nurses, social workers, pharmacists, and spiritual counselors who collaborate with other medical providers. The palliative care team specializes in whole person assessment, symptom management, and advanced-care planning communication. In oncology, palliative care has increasing relevance given recent studies that link palliative care to improved patient quality of life, reduced cost of care, and even improved survival in patients with metastatic cancer.^{2–9} In fact, current national clinical guidelines recommend early combined integration of palliative care with standard oncology care for any patient with metastatic cancer or high symptom burden.¹⁰

Survey studies have found an increase in the availability of palliative care across the United States,¹ with a near 3-fold increase in the number of hospitals with palliative care teams over the past decade. Similarly, research involving single institutions or single health care networks has found an increase in the use of palliative care services.^{11–13} Despite the apparent increasing use of palliative care in select health care settings, we lack an understanding of how palliative care is delivered among patients with cancer across the nation as a whole. The purpose of this study was to characterize the evolution of palliative care services in oncology from a population-based standpoint. Specifically, we focused on defining the growth, use, and regional differences of palliative care delivery among elderly patients (aged >65 years) with advanced cancer.

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Methods

Data

This study identified patients with cancer from the SEER-Medicare linked database. SEER represents a collection of individual cancer registries geographically spread across the United States accounting for approximately 28% of the US population. SEER collects information on incident cancer diagnoses within each cancer registry, including demographic, clinical, tumor-specific, and treatment-related information. Medicare provides federally funded health insurance for patients older than 65 years. The SEER-Medicare linked dataset combines patient information from SEER with claims information from the Medicare program. The Medicare claims data allows the ability to track longitudinal patterns of care and health outcomes beyond what SEER captures. Although some minor differences exist in elderly patients within SEER-Medicare compared with the greater United States, overall this unique population-based dataset allows researchers to follow patterns of care and outcomes from prior to diagnosis through the end of life.¹⁴ The Institutional Review Board of the University of California San Diego deemed this study exempt from review.

Patients

This study included patients 66 years of age and older with breast, prostate, lung, or colorectal cancer, which represent the 4 most common cancers in the United States.¹⁵ SEER-Medicare includes patients 65 years of age and older; however, we included patients 66 years of age and older to allow for a 1-year time window before diagnosis to ascertain preexisting comorbidity (described further later). From the SEER-Medicare database, we initially identified 166,124 patients with histologically confirmed distant metastatic cancer diagnosed between 2000 and 2009. We excluded patients with multiple primary tumors (n=21,550), and those diagnosed at death or on autopsy (n=299). This study focused on palliative care in the oncology setting; therefore, we excluded patients who died of noncancer causes (n=12,043) and patients alive at the end of the follow-up period (n=9,942) on December 31, 2010. As is standard in research involving SEER-Medicare, we excluded those with incomplete Medicare claims data. This resulted in excluding subjects without continuous Medicare Parts A and B, or enrollment in Part C any time from 1 year before di-

agnosis (to determine comorbidity) through death (to identify palliative care). The final study population included 83,022 subjects.

Identifying Palliative Care Consultation

Consultation with a palliative care provider was identified using the International Classification of Diseases, Ninth Revision (ICD-9) code V66.7 (“Encounter for Palliative Care”) which is a V-code modifier for palliative care created in 1996.¹⁶ We identified inpatient and outpatient palliative care consultation separately by their appearance in their respective Medicare files. Note that in Medicare, enrollment into hospice is recorded separately from an encounter with palliative care. Hospice use has been characterized extensively elsewhere, and was not included in this analysis.

Patient Covariates

Patient-related demographic variables obtained in SEER included age at diagnosis, sex, race, marital status, and median household income. Median household income was estimated from the 2000 US Census using census tract data preferentially over zip code data, and divided into quartiles for analysis. Patients with missing household income (n=22) were included in the bottom quartile.¹⁷ Comorbidity before cancer diagnosis was estimated using the Deyo adaptation of the Charlson comorbidity index, which uses inpatient and outpatient Medicare claims data the year prior to a patient’s cancer diagnosis.^{18,19} Individual SEER cancer registries were reclassified into East (Connecticut and New Jersey), Midwest (Detroit and Iowa), South (Georgia, Kentucky, and Louisiana), and West (California, Hawaii, New Mexico, Seattle, and Utah). Care in a teaching hospital was defined as any indirect medical education payment during a hospitalization after cancer diagnosis.

Regional Covariates

This study evaluated the association between the regional use of cancer-related palliative care and regional health care characteristics. Regional geography was evaluated at the level of hospital referral regions. There are 306 hospital referral regions spread across the United States, and each distinct geographic region represents a predefined health care market for tertiary care services.²⁰ We looked for correlations in the regional use of palliative care and various aggregate regional health care characteristics. Regional hospital and provider character-

istics, obtained from the Dartmouth Atlas of Health Care,²¹ included the following variables: number of acute care hospital beds, primary care physicians, hematologist-oncologists, and total physicians. Regional health care use was evaluated with a measure of the average number of days spent in an inpatient hospital and intensive care unit (ICU) in the last 6 months of life, and the percentage of patients who die in a hospital compared with a nonhospital setting. Regional health care expenditure was expressed as the regional annual Medicare reimbursement per enrollee in that specific hospital referral region adjusted for race, age, sex, and geography.²⁰

Statistical Analysis

Patient characteristics were stratified by presence or absence of the palliative care consultation ICD-9 code. Multivariable logistic regression models were used to determine the association between palliative care consult and specific patient characteristics. All patient covariates analyzed in the multivariable model were chosen a priori, and included patient demographic and clinical characteristics thought to potentially impact the use of palliative care services (covariates listed in Table 1). The ecologic analysis to determine associations between palliative care consultation and regional health care characteristics used an average rate of palliative care consultation per each hospital referral region. This average rate of palliative care consultation was further adjusted to account for underlying differences in patient age, race, and sex by adjustment to the 2000 US population.²² We grouped patients into quartiles based on the adjusted rates of palliative care use within each hospital referral region. We evaluated trends between quartiles of palliative care use and regional characteristics with a Cuzick's²³ trend test. All statistical tests were 2-sided, and *P* values less than 0.05 were considered significant. Statistical analyses were performed with SAS version 9.4 (SAS Institute, Inc., Cary, NC).

Results

Among the 83,022 patients with cancer in this study, 5,042 (6.1%) had a record of a palliative care consultation. The fraction of patients receiving a palliative care consultation increased steadily from 3.0% in 2000 to 12.9% in 2009 (Figure 1). Most palliative care consultations occurred in the inpatient setting.

There were 4,186 patients (83%) with only an inpatient consult, 599 (12%) with only an outpatient consult, and 257 (5%) with both an inpatient and outpatient consult. Additionally, a substantial portion of patients had palliative care consultations near the end of life. Among patients with a palliative care consultation, 77% had a consultation within a month of death and 37% had it in the last week of life (Figure 2). Less than 10% of patients had a palliative care consultation more than 3 months before death.

Table 1 demonstrates associations between patient-level characteristics and palliative care consultation. On multivariable analysis, older patients and male patients were less likely to undergo consultation from a palliative care provider. Among a small percentage of the identified cases, prostate cancer was more likely to have a palliative care consultation in contrast to other cancer types. Patients with higher preexisting comorbidity were less likely to receive palliative care consultation. The odds of a palliative care consultation nearly doubled among patients receiving care in a teaching hospital. Patients in the South had lower rates of palliative care use.

Analysis of data by hospital referral region revealed substantial geographic variability in the use of palliative care (Figure 3). The use of palliative care ranged from 0% to 14.1% from the lowest to the highest hospital referral region. Of note, 94% of hospital referral regions had an increase in the use of palliative care over the study period.

Associations between regional health care characteristics and palliative care are presented in Table 2. The likelihood of a palliative care consultation increased with decreased numbers of regional acute care hospital beds. The increased use of palliative care resources was associated with increased numbers of regional physicians per capita. Of note, no marker of aggressive care at the end of life on the regional level was associated with palliative care use. This included the regional average rates of hospitalization use or ICU use in the last 6 months of life, as well as percent of patients dying within a hospital setting. Finally, lower regional annual reimbursement per Medicare enrollee was associated with increased use of palliative care. Between the first and fourth quartile of palliative care use, the regional annual reimbursement decreased by \$1,387 per Medicare enrollee.

Table 1. Patient-Level Predictors of Palliative Care Consultation

Characteristic	Palliative Care Consult		Multivariable Analysis	
	Yes	No	Odds Ratio (95% CI)	P Value
All patients	5,042 (6.1)	77,980 (93.9)		
Age, y				
66–69	1,066 (6.5)	15,396 (93.5)	1	–
70–74	1,297 (6.0)	20,287 (94.0)	0.94 (0.86–1.02)	.12
75–79	1,243 (6.0)	19,457 (94.0)	0.92 (0.84–1.00)	.05
80–84	880 (6.0)	13,911 (94.1)	0.87 (0.79–0.95)	.003
≥85	556 (5.9)	8,929 (94.1)	0.79 (0.71–0.89)	<.0001
Sex				
Female	2,598 (6.5)	37,289 (93.5)	1	–
Male	2,444 (5.7)	40,691 (94.3)	0.85 (0.80–0.91)	<.0001
Race				
White	4,205 (5.9)	66,959 (94.1)	1	–
Black	500 (6.1)	7,657 (93.9)	1.10 (0.99–1.21)	.07
Asian or Pacific Islander	307 (9.1)	3,056 (90.9)	1.11 (0.97–1.26)	.13
Other/Unknown	30 (8.9)	308 (91.1)	1.17 (0.79–1.71)	.43
Ethnicity				
Hispanic	253 (7.1)	3,292 (92.9)	0.93 (0.81–1.07)	.32
Non-Hispanic	4,789 (6.0)	74,688 (94.0)	1	–
Marital status				
Married	2,477 (6.1)	38,226 (93.9)	1.05 (0.99–1.12)	.10
Non-married	2,565 (6.1)	39,754 (93.9)	1	–
Charlson score				
0	2,431 (5.6)	40,793 (94.4)	1	–
1	1,424 (6.6)	20,088 (93.4)	1.03 (0.96–1.11)	.38
2	647 (6.6)	9,149 (93.4)	1.02 (0.93–1.11)	.75
≥3	540 (6.4)	7,950 (93.6)	0.90 (0.82–1.00)	.04
Tumor site				
Breast	258 (6.1)	3,958 (93.9)	0.99 (0.87–1.14)	.93
Colorectal	812 (5.6)	13,721 (94.4)	0.94 (0.87–1.02)	.12
Lung	3,731 (6.2)	56,669 (93.8)	1	–
Prostate	241 (6.2)	3,632 (93.8)	1.21 (1.05–1.40)	.01
Year of diagnosis				
2000	245 (3.0)	7,865 (97.0)	1	–
2001	247 (3.0)	8,063 (97.0)	0.97 (0.81–1.16)	.76
2002	292 (3.4)	8,206 (96.6)	1.14 (0.96–1.36)	.13
2003	358 (4.0)	8,616 (96.0)	1.31 (1.11–1.54)	.002
2004	442 (4.8)	8,803 (95.2)	1.59 (1.35–1.86)	<.0001
2005	487 (5.4)	8,572 (94.6)	1.80 (1.54–2.11)	<.0001
2006	576 (6.6)	8,111 (93.4)	2.25 (1.93–2.62)	<.0001
2007	732 (9.0)	7,387 (91.0)	3.13 (2.70–3.63)	<.0001
2008	810 (10.9)	6,602 (89.1)	3.94 (3.39–4.56)	<.0001
2009	853 (12.9)	5,755 (87.1)	4.83 (4.17–5.60)	<.0001
Geographic area				
East	1,148 (6.7)	15,971 (93.3)	1	–
Midwest	827 (6.9)	11,231 (93.1)	0.94 (0.85–1.03)	.19
South	728 (3.2)	22,228 (96.8)	0.53 (0.48–0.58)	<.0001
West	2,339 (7.6)	28,550 (92.4)	1	–
Population density				
Urban	4,328 (6.4)	63,642 (93.6)	0.99 (0.91–1.08)	.78
Rural	714 (4.7)	14,338 (95.3)	1	–
Teaching hospital				
Yes	3,128 (8.3)	34,778 (91.8)	1.97 (1.85–2.10)	<.0001
No	1,914 (4.2)	43,202 (95.8)	1	–

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Figure 1. Rates of palliative care over study period.

Discussion

This current study found a steady increase in the rate of palliative care consultation across the United States over the past decade. Our findings describing the use of palliative care services parallel and further validate other research describing the availability of palliative care. Morrison²⁴ described palliative care penetration highest in the New England (88% of hospitals), Pacific (77% of hospitals), and mid-Atlantic (77% of hospitals) states and lowest in the west south central (43% of hospitals) and east south central (42% of hospitals) states. Over the past decade, the number of hospitals with palliative care teams has nearly tripled. In 2012, a total of 1,734 of 2,844 hospitals with 50 beds or more reported having a palliative care team, and these teams served an estimated 6 million patients.¹ In 2006, midway through our study period, the American Board of Medical Specialties and the Accreditation Council for Graduate Medical Education recognized Hospice and Palliative Medicine as a subspecialty with its own board examination. We found a steady increase in the use of palliative care before and after 2006.

A notable finding of our study highlights the observation that palliative care interventions occur very near the end of life, most often in an inpatient setting. In fact, more than one-third of patients receiving palliative care did so in the last week of life.

Figure 2. Timing of palliative care consultation.

These findings echo survey data from US cancer centers showing that palliative care referrals occurred late in patients' disease trajectories.¹¹ Additional survey data from Canada also found late referrals to palliative care, often in response to patients with uncontrolled symptoms.²⁵ The landmark study by Temel et al,⁵ published in 2010, demonstrated the impact of early palliative intervention. This study found that patients with metastatic lung cancer had improved quality of life and survival when early palliative care was integrated with standard oncology care. ASCO and NCCN both have clinical guidelines that recommend early integration of palliative care among patients with incurable cancer.^{10,26} It is important to consider that these guidelines were published after our study period (2000–2009), although we found that most palliative care is delivered in the inpatient setting near the end of life. This suggests that palliative care today is far from achieving the recommended early, simultaneous integration delivery model into standard oncology care.

Beyond the timing of palliative care, our study found considerable regional differences in the use of palliative care across the United States. Our analysis by hospital referral region revealed that the rates of palliative care among patients with metastatic cancer ranged from a low of 0% to a high of 14%. We did find that the fraction of patients receiving palliative care consultation increased in regions with more physicians per capita and in regions with lower Medicare expenditure per enrollee. Importantly, the association between palliative care and regional Medicare expenditure in this study does not necessarily imply causality. For example, we cannot assume that the increased use of palliative care led to decreased health care expenditure. This relationship may simply indicate that underlying patient or regional factors led to both increased use of palliative care and decreased use of health care resources. Of note, decreased health care cost is a byproduct not a goal of palliative care consultation. Despite the lack of causality, a recent study found decreased health care cost among hospice enrollees compared with control patients.²⁷ Additional research on administrative data from 8 hospitals found that patients undergoing palliative care had substantially decreased health care costs associated with hospital admissions.¹² Future prospective research or carefully controlled retrospective cohort studies are needed to

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Figure 3. Geographic variation of palliative care consultation.

fully understand the health economic implications of palliative care.

This population-based study has limitations worth considering. Given the nature of SEER-Medicare data, we cannot readily validate the sensitivity or specificity of the ICD-9 code for palliative care. Although the code appears specific to palliative care consultation, undercoding is likely, which could lead us to underestimate palliative care delivery in el-

derly patients with cancer. Additionally, our analysis did not include patients younger than 66 years. We found increasing rates of palliative care among our youngest cohort of patients, which could indicate higher rates among patients younger than 65 years; however, we do not know for certain if these results generalize to a younger population. This representative sample is also limited to patients with cancer located in SEER locations, and therefore our findings may not translate to regions outside of SEER. Finally, we restricted our analysis to breast, colorectal, lung, and prostate cancers, and excluded patients in managed care organizations; therefore, our results may not generalize to other cancers, patients without cancer, or different health care networks.

Despite these limitations, in this population of Medicare patients with advanced cancer we found that the rates of palliative care have steadily increased over the past decade, although consultations appear to occur very near the end of life and mostly in the inpatient setting. Additionally, geographic location substantially influences whether a patient will receive palliative care. These findings provide useful information on potential barriers in palliative care dissemination and provide guidance for future areas of palliative care growth.

Table 2. Regional Characteristics of Palliative Care Consultation

Regional Characteristic	Palliative Care Consultation Rate by Hospital Referral Region ^a				P Value for Trend ^b
	1st Quartile (0.0%–3.5%)	2nd Quartile (3.6%–5.7%)	3rd Quartile (5.7%–7.9%)	4th Quartile (7.9%–14.1%)	
Number of hospital referral regions	32	24	12	25	
Number of patients	21,129	24,422	18,083	19,388	
Regional characteristic					
Acute care hospital beds (per 1,000 residents)	2.89	2.39	2.38	2.09	<.0001
Total physicians (per 100,000 residents)	178	199	198	214	.0001
Primary care physicians (per 100,000 residents)	64	71	73	79	<.0001
Hematologist-oncologists (per 100,000 residents)	2.44	2.75	3.03	3.08	.03
Hospitalization days in last 6 months of life	9.4	10.2	9.4	8.9	.11
ICU days in last 6 months of life	3.3	3.56	3.06	3.23	.57
Percent of patients dying in a hospital	27	28	27	26	.33
Regional Medicare reimbursement per enrollee	\$8,496	\$7,856	\$7,225	\$7,109	<.0001

Abbreviation: ICU, intensive care unit.

^aThe rate of palliative care per hospital referral region was adjusted for differences in patient age, race, and sex.

^bP value represents Cuzick's trend test.

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