Care in the Months before Death and Hospice Enrollment Among Older Women with Advanced Breast Cancer

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BACKGROUND: Variations in hospice use are not well understood.

OBJECTIVE: Assess whether care before death, including the types of physicians seen, number of outpatient visits, and hospitalizations, was associated with hospice use and the timing of enrollment.

DESIGN/SETTING: Observational study of a population-based sample of advanced breast cancer patients included in the Surveillance, Epidemiology, and End Results—Medicare database.

PATIENTS: There were 4,455 women aged ≥ 65 diagnosed with stage III/IV breast cancer during 1992–1999 who died before the end of 2001.

MEASUREMENTS: Hospice use and, among enrollees, enrollment within 2 weeks of death. Independent variables of interest included hospitalizations, outpatient visits, and physicians seen before death.

RESULTS: Adjusted hospice use rates were higher for hospitalized patients (45% if hospitalized for 1–7 days, 46% if 8–20 days, 35% if ≥ 21 days) than those not hospitalized (31%, $P < 0.001$). Adjusted rates were also higher among patients seeing a cancer specialist and primary care provider (PCP; 41%) and those seeing a cancer specialist and no PCP (38%) than among those seeing a PCP and no cancer specialist (30%) or neither type of physician (22%; $P < 0.001$). Hospice use also increased with increasing frequency of outpatient visits ($P < 0.001$). Hospitalizations, physicians seen, and visits were not associated with referral within 2 weeks of death (all $P \geq 0.10$).

DISCUSSION: Care before death is associated with hospice use among older women with advanced breast cancer. Additional research is needed to understand better how differences in patient characteristics and

disease status influence cancer care before death and the role of various types of physicians in hospice referrals.

KEY WORDS: end-of-life care; breast cancer; outpatient care.

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End-of-life care for cancer patients is often inadequate.¹ Many patients die with pain or other uncontrolled symptoms, too little psychosocial support, or after aggressive care that may be of limited benefit.¹ Hospice care can improve symptom management and quality of life for patients at the end of life.^{2–4} Yet, despite recent increases in hospice use,^{5–7} many patients who are eligible for hospice are not enrolled.^{6,8} Understanding variations in hospice use may identify opportunities to increase enrollment.

Prior research has demonstrated significant variation in hospice use based on characteristics of patients and the areas where they live,^{9–22} yet much of this variation remains poorly understood. Some variation in hospice use may be explained by patients' interactions with the health care system at the end of life, including the types of physicians seen, the frequency of visits, and hospitalizations. Physicians initiate most referrals to hospice,⁵ and most hospice enrollees report that their decision to use hospice was influenced by their physician.²³ Yet, physicians may differ in their knowledge and beliefs about hospice,²⁴ their comfort and training in addressing end-of-life issues,²⁵ or their propensity to use life-sustaining therapies for terminally ill patients, and these differences may vary by specialty. Outpatient visits may also influence hospice referrals by providing opportunities for physicians to recognize the need for hospice care. Similarly, hospitalizations, which are frequent at the end of life,^{21,26} may influence hospice use; data suggest that patients living in areas with more hospices are less likely to be hospitalized or receive other aggressive end-of-life care.²¹

Outpatient and inpatient care may also influence the timing of hospice referral for hospice users. Many patients enter hospice late in the course of their illness.^{5,27} The median duration of hospice use declined since 1990,⁵ remaining stable at about 2 weeks since 2000.⁷ One explanation for late hospice referrals is physicians' difficulty with prognostication and their tendency to overestimate survival,²⁸ which may vary by specialty. Although one study of hospice users found no

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difference in timing of enrollment for patients referred by oncologists versus non-oncologists,²⁹ other data suggest that internists and geriatricians refer patients to hospice earlier than oncologists,³⁰ and patients living in areas with more generalist physicians enter hospice earlier than other patients.³¹ Hospitalization may also influence the timing of hospice enrollment if patients are not referred until they are recognized to be very ill and near death.

To better understand variations in hospice use, we examined care before death among women with advanced breast cancer. We assessed the associations of the types of physicians seen, the number of outpatient visits, and hospitalizations with hospice use and the timing of enrollment. We hypothesized that women who were seeing a medical oncologist, women with more outpatient visits, and women who were hospitalized near the end of life would be more likely than others to use hospice care, but that these women would also be more likely than other women to enroll within 2 weeks of death.

METHODS

Data

We used the Surveillance, Epidemiology, and End Results (SEER)—Medicare data for this analysis.³² The SEER program collects uniformly reported data on incident cancers from 11 population-based cancer registries covering approximately 14% of the U.S. population.³³ Since 1991, SEER data have been merged with Medicare administrative data by a matching algorithm that has successfully linked files for more than 94% of SEER registry patients diagnosed at age ≥ 65 .³²

Study Cohort

We selected women aged ≥ 65 years with a first diagnosis of breast cancer during 1992–1999 who were enrolled in Parts A and B of fee-for-service Medicare when diagnosed ($N=65,060$). We excluded 350 patients with histologies suggesting a non-breast primary, 873 women diagnosed at the time of death, and 329 women whose month of diagnosis was unknown. From these 63,508 women, we selected women diagnosed with advanced breast cancer (stage III/IV; $N=6,118$) and identified the 4,600 women who died on or before December 31, 2001, the last date for which vital status information was complete. Finally, we excluded 145 women not continuously enrolled in Parts A and B of fee-for-service Medicare through their death, yielding a final study cohort of 4,455 women.

Dependent Variables

We assessed hospice use for each patient from the date of diagnosis through death. Among hospice users, we measured duration of enrollment from the date of enrollment until discharge or death, and we defined late hospice enrollment as enrollment within 14 days of death.

Independent Variables

Independent variables characterized care before death and included (1) number of outpatient visits, (2) types of physicians seen, and (3) number days hospitalized. We used Current

Procedural Terminology codes to identify all outpatient visits with physicians (Appendix) during the 6 months before hospice enrollment for hospice users or the 6-month period from 7 months through 1 month before death for women who did not use hospice.

We calculated the number of visits to physicians and identified each physician's specialty by linking with American Medical Association data,³⁴ categorizing them as primary care physicians (family practice, internal medicine, general practice, geriatrics), medical oncologists, general surgeons (including a small number of surgical oncologists), radiation oncologists, medical subspecialists, surgical subspecialists, or other specialists. We identified hospitalizations during the same 6-month periods and calculated the number of days hospitalized (summing the days for all hospitalizations if more than one). We categorized hospital care as none, 1–7, 8–20, or ≥ 21 days.

Covariates

The SEER registries document each patient's age, race, Hispanic ethnicity, marital status, history of other cancer (other than non-melanoma skin cancer), residence in a metropolitan county, and American Joint Committee on Cancer³⁵ stage. They also document date of death (through December 31, 2001) and cause of death (through December 31, 2000) based on state vital statistics. We characterized median household income of the census tract of residence using 1990 Census data, classified into quartiles within registry before combining across registries to avoid misclassification because of regional variations. We used the Area Resource File to obtain county-level estimates of the number of hospitals offering hospice, categorized into quartiles.

To measure comorbidity, we calculated Diagnostic Cost Groups (DCGs),³⁶ a risk-adjustment tool for predicting future costs and disease burden for Medicare beneficiaries based on 182 clinical diagnostic categories from inpatient and ambulatory claims (versus 18 for the Charlson score).³⁷ DCGs are highly predictive of mortality for Medicare beneficiaries with myocardial infarction³⁸ and cancer,³⁹ and because they capture so many conditions, they may be particularly useful in differentiating among women whose Charlson score is 0. We calculated summary DCG scores (categorized in quartiles; excluding breast cancer codes) based on the 12 months before death.

Analyses

We used chi-square tests to assess bivariate associations of patient characteristics and care before death with hospice use. We used multivariable logistic regression models to assess whether the independent variables described above were associated with hospice use, adjusting for the covariates described above (categorized as in Table 1). We calculated adjusted rates of the outcomes of interest for our patient population using a standardized regression approach.^{40,41} Similarly, we used chi-square tests and multivariable logistic regression to assess associations between the same set of independent variables and late hospice enrollment.

Because in retrospective studies, it can be difficult to know if physicians identified patients as terminally ill, in sensitivity analyses, we repeated all analyses after restricting the cohort to the 2,946 women who died before the end of 2000 and whose cause of death was listed as breast cancer (cause of

Table 1. Factors Associated with Hospice Use, N=4,455

	Number of women N (%)	Unadjusted proportion using hospice (%)	P value**	Adjusted proportion using hospice (%)	P value†
Age at death in years			0.05		0.16
65–69	509 (11)	34		34	
70–74	954 (21)	37		36	
75–79	990 (22)	39		38	
80–84	883 (20)	40		39	
85 and older	1119 (25)	35		37	
Race‡			0.01		0.17
White	3,751 (84)	38		37	
Black	498 (11)	35		37	
Other	206 (5)	30		32	
Hispanic ethnicity‡			0.99		0.59
Yes	163 (4)	37		38	
No	4,279 (96)	37		37	
Marital status at diagnosis			0.78		0.43
Unmarried	3,144 (71)	37		38	
Married	1,311 (29)	37		36	
Residence			0.43		0.01
Non-metropolitan county	666 (15)	36		32	
Metropolitan county	3,789 (85)	37		38	
SEER region			<0.001		<0.001
San Francisco	301 (7)	32		31	
Connecticut	650 (15)	30		28	
Detroit	854 (19)	44		44	
Hawaii	90 (2)	38		46	
Iowa	592 (13)	43		42	
New Mexico	172 (4)	46		46	
Seattle	526 (12)	36		35	
Utah	160 (4)	37		40	
Atlanta	275 (6)	41		38	
San Jose	189 (4)	43		40	
Los Angeles	646 (14)	27		32	
Median household income in census tract of residence‡			0.02		0.18
Quartile 1 (lowest)	1,382 (31)	34		35	
Quartile 2	1,131 (25)	36		37	
Quartile 3	1,037 (23)	40		40	
Quartile 4 (highest)	840 (19)	39		37	
Year of death			<0.001		<0.001
1992	177 (4)	19		20	
1993	336 (8)	21		21	
1994	423 (9)	28		26	
1995	526 (12)	32		31	
1996	574 (13)	38		36	
1997	544 (12)	38		37	
1998	586 (13)	42		42	
1999	545 (12)	45		46	
2000	440 (10)	46		48	
2001	304 (7)	47		49	
Stage at diagnosis			0.005		<0.001
Stage 3	2,029 (46)	35		34	
Stage 4	2,426 (54)	39		39	
History of a non-breast cancer			0.06		0.04
No	4,214 (95)	37		37	
Yes	241 (5)	43		43	
Comorbidity			<0.001		<0.001
Quartile 1 (lowest)	1,114 (25)	46		60	
Quartile 2	1,113 (25)	41		43	
Quartile 3	1,114 (25)	36		33	
Quartile 4 (highest)	1,114 (25)	25		18	
Number of hospitals with hospice in county			0.04		0.43
Quartile 1 (lowest)	1,139 (26)	38		37	
Quartile 2	1,342 (30)	34		35	
Quartile 3	809 (18)	38		38	
Quartile 4 (highest)	1,165 (26)	39		39	
Number of days hospitalized in 6-month period*			<0.001		<0.001
None	1,832 (41)	27		31	
1–7	789 (18)	49		45	
8–20	832 (19)	51		46	
21+	1,002 (22)	35		35	

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Table 1. (continued)

	Number of women N (%)	Unadjusted proportion using hospice (%)	P value**	Adjusted proportion using hospice (%)	P value†
Types of providers seen in 6-month period*			<0.001		<0.001
PCP and cancer specialist	2,301 (52)	45		41	
PCP and no cancer specialist	834 (19)	27		30	
Cancer specialist and no PCP	899 (20)	39		38	
No PCP or cancer specialist	421 (9)	11		22	
Total number of visits in 6-month period*			<0.001		<0.001
Quintile 1 (lowest)	935 (21)	17		20	
Quintile 2	853 (19)	34		29	
Quintile 3	909 (20)	43		38	
Quintile 4	861 (19)	46		45	
Quintile 5 (highest)	897 (20)	46		52	

*Six-month period before hospice enrollment for patients who entered hospice or the 6-month period from 1 month before death through 7 months before death for patients who did not enroll in hospice.

PCP Primary care provider

**Using the chi-square test

†Using logistic regression to control for all variables in the table; P values for overall effect of categorical variables

‡Twenty-nine patients were missing information on race, 13 patients on Hispanic ethnicity, and 65 were missing Census tract information; dummy variables were included in models so that these patients were not excluded from analyses.

death data were available through 2000). Results were similar and are not presented.

All tests of statistical significance were two sided. We conducted analyses using SAS statistical software, version 8.2 (SAS Institute, Inc., Cary, North Carolina). The Harvard Medical School Committee on Human Studies approved the study protocol.

RESULTS

The 4,455 patients diagnosed with advanced breast cancer had a mean (SD) age at death of 79.0 (7.8) years and 84% were white (Table 1, first column). The median number of days from diagnosis to death was 451 (interquartile range=125 to 964) days. Overall, 1,652 (37%) enrolled in hospice before death. Among hospice enrollees, the median duration of enrollment was 22 days, and the mean (SD) was 61.2 (112.5).

Most patients (59%) had at least 1 hospitalization during the 6 months before hospice enrollment or the corresponding 6-month period for non-hospice enrollees. During the same period, the median number of outpatient visits was 14. About half of patients (52%) had visits with both a primary care physician and a cancer specialist (median=5 visits with each). Nineteen percent had visits with a primary care physician but no cancer specialist (median=5 visits with the primary care physician), and 20% had visits with cancer specialists but no primary care provider (median=9 visits with cancer specialists). Nine percent of patients saw neither a cancer specialist nor primary care physician during this period.

Hospice Use

In unadjusted analyses, hospice rates were highest among women aged 70–84 years and lowest in women aged 65–69 and ≥85 (Table 1). White women used hospice more often than black women or women of other races. Hospice use varied by SEER region, with women in New Mexico, Detroit, Iowa, and San Jose most likely and women in Los Angeles, Connecticut, and San Francisco least likely to use hospice care. Hospice use varied somewhat by area median household income, with women in areas with the lowest quartile of income least likely to use

hospice. Women with metastatic breast cancer at diagnosis were more likely to use hospice than other women, as were women with less comorbid illness. Women hospitalized before death had higher rates of hospice use than women not hospitalized. Hospice use varied by types of physicians seen, with highest rates among women who had visits with both a primary care physician (PCP) and a cancer specialist and lowest among those seeing neither of these types of physicians. Women with more physician visits were more likely to use hospice.

In analyses adjusted for all patient characteristics and care received (Table 1, right columns), we found no differences in hospice use by age, race/ethnicity, or marital status, but observed that women in metropolitan areas were more likely than other women to use hospice care. Women living in New Mexico, Hawaii, and Detroit had the highest rates of hospice use. Rates of hospice use increased substantially over time and were higher for women with metastatic cancers at diagnosis, women with a history of a prior cancer other than breast cancer, and women with fewer comorbid illnesses, possibly because their cancer was the primary focus of their care.

The types of providers seen near the end of life remained strongly associated with hospice use in adjusted analyses. Patients who saw both a PCP and a cancer specialist were most likely to use hospice care (41%), followed by women who saw a cancer specialist without a PCP (38%), women who saw a PCP but no cancer specialist (30%), and women who saw neither type of physician (22%). Women with more outpatient visits had higher rates of hospice use than women with fewer visits, and women who were hospitalized were more likely to use hospice care than women who were not hospitalized, with highest rates among those hospitalized for less than 21 days.

Late Hospice Enrollment

Forty-one percent of hospice users were enrolled within 2 weeks of death. In unadjusted analyses, women aged ≥85 were least likely to be enrolled late. The proportion enrolling late did not vary by race, ethnicity, residence, income, year of death, stage, or having a history of a prior cancer, but varied by geographic area (Table 2). Patients who were hospitalized were more likely to enroll late than patients who were not hospitalized, as were patients with more outpatient visits. Patients who

Table 2. Factors Associated with Late Enrollment in Hospice Among Hospice Users, N=1,652

	Number of women in hospice N (%)	Unadjusted proportion enrolled within 2 weeks of death (%)	P value*	Adjusted proportion enrolling within 2 weeks of death (%)	P value†
Age at death in years			0.005		0.11
65–69	172 (10)	45		43	
70–74	32 (21)	48		46	
75–79	390 (24)	39		38	
80–84	349 (21)	40		41	
85 and older	389 (24)	35		37	
Race‡			0.97		0.95
White	1,418 (86)	41		41	
Black	173 (10)	42		40	
Other	58 (4)	39		38	
Hispanic ethnicity‡			0.13		0.17
Yes	1,587 (96)	47		41	
No	60 (4)	40		46	
Marital status at diagnosis			0.01		0.30
Unmarried	1,170 (71)	39		39	
Married	482 (29)	46		44	
Residence			0.12		0.43
Non-metropolitan county	238 (14)	36		38	
Metropolitan county	1,414 (86)	42		41	
SEER region			0.003		0.02
San Francisco	95 (6)	39		38	
Connecticut	198 (12)	49		51	
Detroit	374 (23)	45		43	
Hawaii	34 (2)	35		32	
Iowa	252 (15)	33		37	
New Mexico	79 (5)	47		50	
Seattle	188 (11)	34		35	
Utah	60 (4)	53		56	
Atlanta	114 (7)	38		36	
San Jose	82 (5)	34		32	
Los Angeles	176 (11)	40		36	
Median household income in census tract of residence‡			0.21		0.06
Quartile 1 (lowest)	472 (29)	40		39	
Quartile 2	408 (25)	42		42	
Quartile 3	420 (25)	38		38	
Quartile 4 (highest)	327 (20)	42		42	
Year of death			0.86		0.83
1992	34 (2)	50		52	
1993	72 (4)	47		47	
1994	120 (7)	39		39	
1995	166 (10)	36		37	
1996	217 (13)	42		43	
1997	205 (12)	40		39	
1998	246 (15)	41		40	
1999	244 (15)	40		42	
2000	204 (12)	40		40	
2001	144 (9)	43		41	
Stage at diagnosis			0.27		0.07
Stage 3	707 (43)	42		43	
Stage 4	945 (57)	40		39	
History of a non-breast cancer			0.22		0.12
No	1,549 (94)	41		41	
Yes	103 (6)	35		33	
Comorbidity			<0.001		0.28
Quartile 1 (lowest)	515 (31)	33		37	
Quartile 2	455 (28)	41		40	
Quartile 3	399 (24)	46		44	
Quartile 4 (highest)	283 (17)	48		44	
Number of hospitals with hospice in county			0.40		0.56
Quartile 1 (lowest)	435 (26)	44		42	
Quartile 2	455 (28)	41		43	
Quartile 3	311 (19)	39		41	
Quartile 4 (highest)	451 (27)	39		37	
Number of days hospitalized in 6 months before hospice enrollment			<0.001		0.16
None	489 (29)	33		36	
1–7	389 (24)	40		42	

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Table 2. (continued)

	Number of women in hospice N (%)	Unadjusted proportion enrolled within 2 weeks of death (%)	P value*	Adjusted proportion enrolling within 2 weeks of death (%)	P value†
8–20	427 (26)	48		45	
21+	347 (21)	44		40	
Types of providers seen in 6 months before hospice enrollment			0.07		0.89
PCP and cancer specialist	1,029 (62)	43		41	
PCP and no cancer specialist	225 (14)	34		39	
Cancer specialist and no PCP	352 (21)	39		40	
No PCP or cancer specialist	46 (3)	35		43	
Total number of visits in 6 months before hospice enrollment			<0.001		0.10
Quintile 1 (lowest)	160 (10)	33		39	
Quintile 2	292 (18)	33		37	
Quintile 3	395 (24)	42		43	
Quintile 4	395 (24)	39		37	
Quintile 5 (highest)	410 (25)	50		45	

PCP Primary care provider

*Using the chi square test

†Using logistic regression to control for all variables in the table; P values for overall effect of categorical variables

‡Three patients were missing information on race, 5 patients on Hispanic ethnicity, and 25 were missing Census tract information; dummy variables were included in models so that these patients were not excluded from analyses.

saw a cancer specialist but no PCP were most likely to enroll late with patients who saw a PCP and no cancer specialist least likely to enroll late, although these differences were of borderline statistical significance ($P=0.07$).

In adjusted analyses, few patient characteristics were associated with late hospice enrollment (Table 2, right columns). Patients living in Utah, Connecticut, and New Mexico enrolled late more often than women in other areas. Despite increasing rates of hospice use over time, we found no association between year of diagnosis and the likelihood of late enrollment. Although women hospitalized for 1–7 days or 8–20 days were more likely to be enrolled in hospice late than non-hospitalized patients, the overall effect of hospitalization on late hospice enrollment was not statistically significant. The number of outpatient visits and types of physicians seen were not associated with late hospice enrollment.

DISCUSSION

We examined use of hospice care among elderly breast cancer patients and found that the type and intensity of inpatient and outpatient care before death is strongly associated with hospice use. Women who were hospitalized before death were more likely than others to use hospice, with highest rates among those hospitalized for less than 3 weeks. In addition, patients with more visits to physicians and those seeing cancer specialists were more likely to use hospice than those with fewer visits and those without visits with cancer specialists. Despite the influence of care before death on hospice use, after adjusting for patient characteristics, hospitalizations, outpatient visits, and the types of physicians seen did not influence the timing of hospice enrollment.

Our finding that hospitalizations (particularly those of shorter durations) are associated with hospice care suggests that hospitalization may be a triggering event that prompts patients and providers to recognize that death is nearing and

may prompt discussions about hospice. Similarly, frequent outpatient visits may prompt patients and providers to consider hospice, particularly if those visits are related to declining health status with progression of terminal illness, or they may provide additional opportunities for discussing end-of-life issues, such as hospice.

Other data suggest that physician specialty, board certification, and knowledge⁴² as well as positive beliefs about hospice²⁴ are associated with physicians' reports of referring patients to hospice. Our finding that patients seeing cancer specialists were more likely to be referred to hospice is consistent with other data finding higher hospice referrals among patients seeing a medical oncologist.²² Because cancer specialists have more experience caring for terminally ill patients, they may interact more frequently with local hospices, potentially leading to more hospice referrals. Alternatively, these visits with cancer specialists might suggest that the presence of active and/or terminal cancer had been better recognized in this group of patients.

Despite increases in hospice use, the median duration of enrollment for all conditions has declined since 1990⁵. Earlier referral to hospice may maximize the benefits of hospice for patients and their families, and internists recommend approximately 3 months as the ideal duration of hospice care before death.⁴³ However, there is not a consensus among oncologists, and the timing of hospice referral may depend on the range of services available in local hospices, such as palliative anti-cancer therapies. The patients in our cohort had a median duration of enrollment of just over 3 weeks, and 41% were enrolled within 2 weeks of death. Our finding of no association between the types of physicians seen and likelihood of late hospice enrollment after adjusting for other patient factors is consistent with another study.²⁹ Although we lacked statistical power to identify differences in late hospice enrollment of less than 7 percentage points for a two-group comparison, our findings suggest that interventions aimed at care before diagnosis, such as changing the mix of providers caring for

terminally ill cancer patients, are unlikely to influence timing of hospice enrollment.

Although other studies have found that patients who are younger,^{9,10} white,^{9,11–14} and married^{10,15,16} were more likely to use hospice, among our cohort of older breast cancer patients, we found no differences by age, race, ethnicity, or marital status. Future efforts to understand these demographic differences in hospice use should focus on patients with other cancers. Similar to other studies,^{9,10,19,20,22} we found that women living in urban areas were more likely than women in rural areas to enroll in hospice, and we found significant variation by geographic area. Focused efforts to understand how patients, physicians, and hospices interact at the local level may be important to understand better the reasons for these area-level variations; our study suggests that future studies must also consider patients' interactions with physicians and hospitals.

Our study has several limitations. First, we did not know patients' clinical situations or their preferences for hospice care, nor did we have information about individual patients' or physicians' attitudes about hospice. Second, we studied only older women with breast cancer residing in 11 areas of the United States, so the generalizability of our findings to others requires further study. Nevertheless, older women make up the majority of breast cancer patients, and the SEER areas studied represent 14% of the U.S. population.⁴⁴ Third, we relied on administrative data to identify physicians, and our method for identifying provider specialty may have misclassified some physicians, particularly those with more than one specialty or practice site. Nevertheless, the American Medical Association data may be the most reliable source of physician specialty.³⁴ Fourth, we did not examine home health care use, which is common among cancer patients,⁴⁵ and may substitute for hospice care for some patients. Finally, some have questioned the validity of retrospective studies of end-of-life care because it can be difficult to know when physicians perceive patients' terminal status.⁴⁶ To address this concern, we studied only women diagnosed with advanced cancer, and in sensitivity analyses, we restricted the sample to patients dying of breast cancer to maximize the likelihood of studying a cohort known to be terminally ill.⁴⁷

In conclusion, we found that care before death is associated with hospice use among older women with advanced breast cancer. Women who are hospitalized are more likely to use hospice as are women with more outpatient visits, especially visits with cancer specialists. These factors did not, however, influence likelihood of late enrollment. Additional research is needed to better understand how differences in patient characteristics and disease status influence the outpatient care that cancer patients receive at the end of life as well as the role of various types of physicians in initiating hospice care.

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APPENDIX

Current Procedure Technology codes used for identifying outpatient visits include codes 99201–99205, 99211–99215, 99241–99245, 99381–99387, 99391–99397, 99401–99404, 99411–99412, 99420–99429, 99354–99360.

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