Physicians' Propensity To Discuss Prognosis Is Associated with Patients' Awareness of Prognosis for Metastatic Cancers

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Abstract

Background: Prognosis discussion is an essential component of informed decision-making. However, many terminally ill patients have a limited awareness of their prognosis and the causes are unclear.

Objective: To explore the impact of physicians' propensity to discuss prognosis on advanced cancer patients' prognosis awareness.

Design: Cancer Care Outcomes Research and Surveillance Consortium (CanCORS) study, a prospective cohort study with patient and physician surveys.

Setting/Subjects: We investigated 686 patients with metastatic lung or colorectal cancer at diagnosis who participated in the CanCORS study and reported about their life expectancy. Data were linked to the physician survey from 486 physicians who were identified by these patients as filling important roles in their cancer care.

Results: Few patients with metastatic cancers (16.5%) reported an accurate awareness of their prognosis, defined as reporting a life expectancy of less than 2 years for lung cancer or less than 5 years for colorectal cancer. Patients whose most-important-doctor (in helping patient make decisions) reported discussing prognosis with terminally ill patients earlier were more likely than those whose doctors deferred these discussions to have an accurate prognosis awareness (adjusted proportion, 18.5% versus 7.6%; odds ratio, 3.23; 95% confidence interval, 1.39–7.52; $p=0.006$).

Conclusions: Few patients with advanced cancer could articulate an accurate prognosis estimate, despite most having received chemotherapy and many physicians reported they would discuss prognosis early. Physicians' propensity to discuss prognosis earlier was associated with more accurate patient reports of prognosis. Enhancing the communication skills of providers with important roles in cancer care may help to improve cancer patients' understanding of their prognosis.

Introduction

NATIONAL GUIDELINES recommend advance care planning, including clear and consistent discussions about prognosis, for patients with terminal illness and life expectancy of 1 year or less.^{1–3} Knowledge of prognosis is essential for terminally ill patients because prognosis awareness can influence their preferences for aggressive therapy versus supportive care.^{4–6} Other evidence suggests that truthful communication about prognosis is not harmful.⁷

Several studies have documented that patients with metastatic cancers tend to overestimate their prognosis.^{4,5,8} Limited prognosis awareness may reflect a patient's preference for not knowing prognosis, but it may also reflect the lack of an adequate discussion about prognosis with their physicians.^{8–15} In fact, physicians differ widely in their propensity to discuss prognosis with their patients with advanced cancer, and in the timing of these discussions.^{16,17}

Although patients' understanding of prognosis is likely shaped by physician communication on this topic, prior work

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has generally examined patient and physician reports of communication separately. The Cancer Care Outcomes Research and Surveillance (CanCORS) Consortium,^{18,19} a large, multiregional, population- and health system-based cohort study of patients with lung and colorectal cancer, collected survey data from patients and their physicians, providing a unique opportunity to evaluate the potential association between physicians' reported behaviors and patients' perceptions of their prognosis. We studied CanCORS participants with metastatic cancer at diagnosis to test the hypothesis that patients of physicians who report generally discussing prognosis earlier have more accurate awareness of their life expectancy. We also examined whether other patient or physician factors were associated with better prognosis awareness.

Methods

Study design

The CanCORS study prospectively enrolled over 10,000 patients aged 21 years or older who were diagnosed with lung or colorectal cancer of any stage between 2003–2005 and lived in one of five areas (Northern California; Los Angeles County, California; North Carolina; Iowa; or Alabama) or received care in one of five large health maintenance organizations (HMOs) or 15 Veterans Affairs medical centers.^{18,19} Data were collected from baseline patient interviews performed approximately 3–6 months after diagnosis (or interviews of surrogates if patients were too ill or deceased; participation rate, 60%), medical record abstractions, and surveys of physicians with important roles in patients' cancer care (participation rate, 61%). This study was approved by the human subjects committee at all participating institutions.

Participants

Among 2670 patients newly diagnosed with stage IV lung or colorectal cancer, we focused on 1099 who were alive at the time of the baseline interview and completed the interview themselves, and then restricted the cohort to the 1066 who responded to the question about prognosis. We then linked these data with physician survey data from physicians who were identified by CanCORS participants (in baseline interviews) as filling key roles in their cancer care, including providing/discussing chemotherapy (chemotherapy doctor), surgery (surgeon), or radiation therapy; helping to make treatment decisions ("most-important-doctor") or referring patients to these key providers.¹⁷ Because each patient may have more than one physician, we prespecified a hierarchy to identify the physician with whom to link based on physician responses from the: (1) most-important-doctor, (2) chemotherapy doctor, (3) primary care physician, and (4) surgeon.

Accordingly, we excluded 166 patients who did not identify any physician filling a key role in their care and 214 patients who did not have a completed physician survey from at least one physician filling one of these roles, leaving a final cohort of 686 patients for whom we had at least one physician survey (Fig. 1). Among these patients, 410 had a survey from the physician they identified as their most-important-doctor and that survey was used for analyses. For the remaining patients, we linked with surveys of other doctors based on the role of the physician, prioritizing physicians likely to be

engaged in discussions about prognosis/treatment, including chemotherapy doctor ($n=138$), primary care physician ($n=60$), or surgeons ($n=78$).

Prognosis awareness

Our primary outcome of interest was whether patients with metastatic cancer reported an accurate awareness of their prognosis (accurate versus not). Patients were asked, "Based on your understanding about what your doctors have told you about your cancer, your health in general, and the treatments you are receiving, how long do you think you have to live?" Patients' open-ended answers were coded as less than 1 year; 1 year or more but less than 2 years; 2 years or more but less than 5 years; 5 years or more. In pilot testing the instrument, some patients were unable to provide a time horizon despite prompting, and based on patients' responses, interviewers also coded responses of "in God's hands," and "do not know." Recognizing the median survival after the detection of distant metastases for lung cancer is approximately 4–10 months^{20–22} and for colorectal cancer is less than 2 years^{23,24} and at the time of the survey participants had already survived 3–6 months, we defined a relatively accurate perception of prognosis as less than 2 years for stage IV lung cancer and less than 5 years for stage IV colorectal cancer (Table 1). Patients who responded "in God's hands" or "do not know" were considered not to have an accurate prognosis awareness in the primary analysis.

Physician's propensity to discuss prognosis

To understand each physician's propensity for timing of discussions regarding prognosis, physicians were asked: "Assume you are caring for a patient who is newly diagnosed with metastatic cancer, but is currently feeling well. You estimate that the patient has 4 to 6 months to live. When, in the course of the typical patient's illness, are you most likely, for the first time, to discuss prognosis with this patient or family?" Response options included "now," "when the patient first has symptoms," "when there are no more non-palliative treatments," "only if the patient is hospitalized," and "only if the patient or family bring it up." We classified physicians responding "now" as likely to have earlier discussions of prognosis.¹⁷

Covariates

Covariates included variables specified *a priori* as potential confounders between physician propensity for timing of discussion and patients' prognosis awareness. Patient-level covariates included cancer type, age at diagnosis, gender, self-reported race/ethnicity, being married/living with a partner, education, income, primary insurer, HMO enrollment, speaking English at home, geographic region, self-reported comorbidity, receipt of chemotherapy before the interview, number of days from diagnosis to interview (quintiles), and number of days from interview until death. We also included physician characteristics, including whether the physician surveyed was named as the patient's most-important-doctor, self-reported specialty, gender, age, race/ethnicity, and the number of terminally ill patients cared for in the past year. Variables were categorized as in Table 2.

FIG. 1. Flowchart of the study cohort from Cancer Care Outcomes Research and Surveillance (CanCORS) Database. For each patient, a prespecified hierarchy was used to identify the physician with whom to link based on physician responses from the: (1) most-important-doctor, (2) chemotherapy doctor, (3) primary care physician, and (4) surgeon.

Statistical analysis

We first described the proportion of patients reporting an accurate prognosis awareness by patient and physician characteristics. We used multivariable logistic regression to identify if physicians' report of discussing prognosis "now" was associated with patients' prognosis awareness, adjusting for all other physician and patient characteristics described above. Because we set a prespecified hierarchy of the role of physicians (most-important-doctor or not) assuming that most-important-doctors should be particularly influential, an interaction term between most-important-doctor and

physicians' propensity to discuss prognosis was included in the model. Generalized estimating equations with robust variance estimators were used to account for the clustering of patients with physicians. We then calculated adjusted rates of prognosis awareness for each covariate by direct standardization using the regression model.²⁵

In a series of sensitivity analyses, we repeated analyses for four subpopulations: (1) patients for whom we had the survey response from their most-important-doctor; (2) patients who died less than 2 years after diagnosis; (3) excluding patients who answered "in God's hands" to the prognosis question (rather than coding this as inaccurate prognosis awareness);

TABLE 1. RESPONSES ABOUT LIFE EXPECTANCY FOR SIX HUNDRED EIGHTY-SIX PATIENTS WITH STAGE IV LUNG OR COLORECTAL CANCER

Response about Life Expectancy	Lung Cancer n (%)	Colorectal Cancer n (%)
Less than 1 year	40 (10.3) ^a	9 (3.0) ^a
At least 1 year, but less than 2 years	32 (8.2) ^a	16 (5.4) ^a
At least 2 years, but less than 5 years	41 (10.6)	16 (5.4) ^a
At least 5 years	76 (19.6)	131 (44.0)
“Do not know”	154 (39.7)	95 (31.9)
“In God’s hands”	45 (11.6)	31 (10.4)
Total	388 (100)	298 (100)

^aThe responses about life expectancy of less than 2 years for stage IV lung cancer and under 5 years for stage IV colorectal cancer were defined as a relatively accurate perception of prognosis.

and (4) further excluding patients who answered “do not know” from the above subpopulation. We also conducted the multinomial logistic model with a three-category dependent variable (aware, not aware, and “in God’s hands”/“do not know”). Item nonresponse was infrequent (<3% for most variables except income at 8%); we used multiple imputation²⁶ to impute missing data for all items except the dependent variable. All analyses were performed on the multiply imputed datasets with SAS statistical software, version 9.2 (SAS Institute Inc., Cary, NC); all statistical tests were two-sided.

Results

Cohort characteristics

The study cohort included 686 patients with stage IV lung or colorectal cancer with a median age of 63 years; 49% were women, 57% had lung cancer, and 88% had received chemotherapy before the interview (Table 2). The median time from diagnosis to interview was 4.3 months (interquartile range, 3.5–5.4 months). Overall, 589 (86%) identified a most-important-doctor, and for 410 (70%) of these patients, we had a completed survey from that most-important-doctor.

Compared with the 380 patients excluded because they could not identify an important physician or the physician did not complete the survey, the 686 included patients had more women, fewer black patients, and more patients with higher education or incomes ($p < 0.05$ for all comparisons) but the groups had similar prognosis awareness and duration from interview until death.

Linked physician survey

These 686 patients were linked with 486 doctors who played a major role in their cancer care and responded to the CanCORS physician survey. On average, each doctor was linked to 1.4 patients (range, 1–8) although most physicians (77%) were linked to one patient. The median age of the 486 physicians was 50 years, 83% were men, 40% were medical oncologists, 26% were primary care physicians, 19% were surgeons, and 15% reported another specialty. Only 8% of the 388 patients with lung cancer were linked with a surgeon, versus 28% among patients with colorectal cancer.

Most physicians (70.8%) reported they would discuss prognosis “now” with a terminally ill cancer patient, whereas other physicians would wait until the patient has symptoms or there are no further treatments, and 12.8% would only discuss prognosis if the patient or family brings it up (Fig. 2).

Patients’ prognosis awareness

Of the 686 patients with stage IV lung or colorectal cancer, 113 (16.5%) had an accurate awareness of their prognosis, i.e., reporting a life expectancy of less than 2 years for lung cancer or less than 5 years for colorectal cancer (Table 1). The proportion reporting an accurate prognosis awareness was similar for patients with lung and colorectal cancer (19% versus 14%; $p = 0.10$). Many patients were unable to provide an estimate, reporting without prompting that their prognosis was “in God’s hands” (11%) or “do not know” (36%).

In the multivariable model adjusted for patient and physician characteristics, patients whose most-important-doctor reported generally discussing prognosis “now,” compared with patients whose most-important-doctor did not report discussing prognosis “now,” were more likely to report an accurate prognosis awareness (18.5% versus 7.6%; odds ratio [OR] = 3.23; 95% confidence interval [CI] = 1.39–7.52; $p = 0.006$; Table 2). There was no significant association between physician specialty and patient prognosis awareness; however, patients whose physician cared for more than 10 terminally-ill patients in the last year were more likely to have an accurate prognosis awareness. Individuals who died within 3 months after the interview were most likely to be aware of their prognosis, and those who lived more than 2 years were least likely to be (28.6% versus 9.8%; $p < 0.001$).

In sensitivity analyses when we repeated analyses for four subpopulations described above, results were similar, with patients whose most-important-doctor reported discussing prognosis “now” more likely to have an accurate prognosis awareness than those whose most-important-doctor did not report discussing prognosis “now” (Table 3). Moreover, when we used multinomial logistic regression to examine prognosis awareness categorized as aware, not aware, or do not know/“in God’s hands,” we found that patients whose most-important-doctor reported discussing prognosis “now” were more likely to report an accurate prognosis awareness (OR = 3.17; 95% CI = 1.36–7.37; $p = 0.007$) and less likely to answer “do not know”/“in God’s hands” (OR = 0.51; 95% CI = 0.31–0.83; $p = 0.007$), compared with patients whose most-important-doctor reported not discussing prognosis “now” (Table 4).

Discussion

Current guidelines recommend that physicians be open and honest in communicating about prognosis and treatment options with advanced cancer patients.^{1–3} In a large multi-regional population- and health system-based cohort of patients with metastatic lung or colorectal cancer, we found that few (16%) patients who were alive 3–6 months after diagnosis had an accurate understanding of their prognosis although 88% had received chemotherapy. Nonetheless, we also found that patients of physicians who reported a greater propensity for earlier discussions of prognosis were more likely to have a relatively accurate awareness of life

TABLE 2. CHARACTERISTICS AND ASSOCIATIONS WITH PROGNOSIS AWARENESS FOR PATIENTS WITH STAGE IV LUNG OR COLORECTAL CANCER^a

Characteristics	n (%)	Unadjusted proportion with accurate prognosis awareness	Adjusted proportion with accurate prognosis awareness	Odds Ratio	(95% CI)	p value
Role and response of the surveyed physician^b						0.042
Most-important-doctor does not discuss “now”	109 (15.9)	9.2	7.6	1.00	—	
Most-important-doctor discusses “now”	301 (43.9)	18.3	18.5	3.23	(1.39–7.52)	
Not most-important-doctor does not discuss “now”	79 (11.5)	17.7	16.8	2.78	(1.15–6.70)	
Not most-important-doctor discusses “now”	197 (28.7)	17.3	18.8	3.30	(1.33–8.17)	
Characteristics of the surveyed physician						
Specialty						0.62
Primary care physician	129 (18.8)	14.7	16.4	1.00	—	
Medical oncologist	349 (50.9)	17.8	14.9	0.87	(0.40–1.89)	
Surgeon	114 (16.6)	14.9	20.8	1.42	(0.61–3.26)	
Others	94 (13.7)	16.0	18.8	1.20	(0.50–2.90)	
Physician gender						0.099
Male	567 (82.7)	15.3	15.3	1.00	—	
Female	119 (17.3)	21.9	21.8	1.68	(0.91–3.13)	
Physician age, years						0.192
30–39	118 (17.2)	20.8	19.8	1.00	—	
40–49	205 (29.9)	12.1	11.2	0.46	(0.22–0.95)	
50–54	160 (23.3)	17.7	17.5	0.84	(0.39–1.81)	
55–59	136 (19.8)	20.0	20.0	1.02	(0.47–2.17)	
≥60	67 (9.8)	12.2	17.4	0.83	(0.32–2.14)	
Physician race						0.156
White	496 (72.3)	16.4	16.0	1.00	—	
Asian	129 (18.8)	19.6	20.9	1.48	(0.82–2.67)	
Other	61 (8.9)	10.2	10.7	0.58	(0.24–1.44)	
No. of terminally ill patients cared for in last year						0.068
0–10	168 (24.5)	9.5	10.2	1.00	—	
11–20	118 (17.2)	21.2	18.1	2.16	(1.03–4.55)	
21–60	194 (28.3)	19.6	20.8	2.68	(1.22–5.89)	
≥61	206 (30.0)	16.5	16.1	1.83	(0.81–4.17)	
Patient characteristics						
Cancer type						0.165
Lung	388 (56.6)	18.6	14.7	1.00	—	
Colorectal	298 (43.4)	13.8	20.0	1.57	(0.83–2.97)	
Patient age, years						0.183
21–54	183 (26.7)	13.7	17.1	1.00	—	
55–59	85 (12.4)	23.5	26.9	2.02	(0.94–4.34)	
60–64	104 (15.2)	21.1	23.3	1.59	(0.78–3.23)	
65–69	99 (14.4)	11.1	10.0	0.48	(0.18–1.27)	
70–74	101 (14.7)	18.8	13.7	0.73	(0.27–1.99)	
75–79	66 (9.6)	15.2	14.8	0.82	(0.27–2.51)	
≥80	48 (7.0)	12.5	9.3	0.45	(0.14–1.40)	
Gender						0.25
Male	351 (51.2)	16.5	14.9	1.00	—	
Female	335 (48.8)	16.4	18.3	1.34	(0.82–2.18)	
Race/ethnicity						0.45
White	496 (72.3)	19.2	17.8	1.00	—	
Black	77 (11.2)	5.2	8.3	0.37	(0.11–1.21)	
Hispanic	42 (6.1)	11.9	13.2	0.66	(0.17–2.50)	
Asian	46 (6.7)	13.0	17.0	0.94	(0.30–2.88)	
Other	25 (3.6)	12.0	10.6	0.50	(0.13–1.86)	

(continued)

TABLE 2. (CONTINUED)

<i>Characteristics</i>	<i>n (%)</i>	<i>Unadjusted proportion with accurate prognosis awareness</i>	<i>Adjusted proportion with accurate prognosis awareness</i>	<i>Odds Ratio</i>	<i>(95% CI)</i>	<i>p value</i>
Married/live with partner						0.094
Yes	439 (64.0)	17.7	18.5	1.00	—	
No	247 (36.0)	14.3	13.0	0.61	(0.34–1.09)	
Education						0.33
<High school	93 (13.6)	9.7	13.2	1.00	—	
High school/some college	415 (60.5)	16.1	15.4	1.23	(0.57–2.68)	
≥ College degree	178 (25.9)	20.9	20.2	1.83	(0.74–4.49)	
Income, \$						0.71
< 20 000	165 (23.6)	16.3	19.2	1.00	—	
20,000–39,999	192 (29.0)	13.8	14.6	0.67	(0.34–1.35)	
40,000–59,999	139 (19.8)	18.6	16.8	0.82	(0.40–1.70)	
≥ 60,000	190 (27.6)	17.6	15.7	0.75	(0.33–1.70)	
Primary insurer						0.090
Medicare	307 (44.7)	15.6	20.2	1.00	—	
Private	305 (44.5)	16.7	12.8	0.52	(0.24–1.14)	
Other	74 (10.8)	18.9	21.5	1.10	(0.45–2.72)	
Health maintenance organization member						0.23
No	489 (71.3)	14.3	15.1	1.00	—	
Yes	197 (28.7)	21.8	19.2	1.41	(0.81–2.46)	
Speaks English at home						0.31
Yes	666 (97.1)	16.8	16.7	1.00	—	
No	20 (2.9)	5.0	6.1	0.28	(0.02–3.27)	
Region						0.136
West	421 (61.4)	18.1	17.1	1.00	—	
South	156 (22.7)	8.3	10.4	0.52	(0.23–1.14)	
Other	109 (15.9)	22.0	20.9	1.34	(0.69–2.61)	
Comorbidity						0.41
None	320 (46.6)	13.1	14.1	1.00	—	
One	216 (31.5)	19.5	18.8	1.51	(0.86–2.64)	
Two	98 (14.3)	18.2	15.8	1.17	(0.57–2.39)	
Three and more	52 (7.6)	21.1	20.7	1.74	(0.76–3.97)	
Received chemotherapy before interview						0.85
Yes	601 (87.7)	16.5	16.3	1.00	—	
No	85 (12.3)	16.5	17.1	1.07	(0.54–2.13)	
Days from diagnosis to interview						0.35
76–105	171 (24.9)	13.5	16.8	1.00	—	
106–128	175 (25.5)	14.9	13.5	0.74	(0.38–1.45)	
129–162	169 (24.7)	20.1	20.3	1.32	(0.69–2.53)	
163–666	171 (24.9)	17.5	15.7	0.91	(0.45–1.82)	
Days from interview until death						< 0.001
1–89	75 (10.9)	32.0	28.6	1.00	—	
90–179	97 (14.1)	20.6	21.7	0.65	(0.32–1.35)	
180–269	77 (11.2)	27.3	28.1	0.98	(0.42–2.27)	
270–364	52 (7.6)	15.4	17.7	0.49	(0.18–1.31)	
1–2 years	137 (20.0)	10.9	10.8	0.25	(0.11–0.59)	
≥ 2 years	248 (36.2)	10.1	9.8	0.23	(0.11–0.48)	

^aOdds ratios and adjusted rates were calculated using the logistic regression adjusted for all variables listed in the table. Confidence intervals take into account the clustering of patients with physicians. The *p* value reflects a global test of the significance of the variable.

^bPhysicians reported their favored timing of prognosis discussion with a terminally ill patient who they believed to have 4–6 months to live. CI, confidence interval.

FIG. 2. Physician response about the timing of prognosis discussion with a terminally ill patient who has 4–6 months to live ($n=486$).

expectancy than patients whose physicians reported discussing prognosis later in their course of illness. This suggests that physicians' communication behaviors may play an important role in explaining the very low rate of prognostic understanding we observed among patients with incurable cancers.

Does physician communication behavior account for the whole of patient prognosis awareness? Over 70% of physicians in our study reported that they would discuss prognosis "now" with a terminally ill patient who they believed to have 4–6 months to live, yet only 16.5% of patients reported an accurate awareness of their prognosis. The low degree of prognosis awareness is consistent with other studies suggesting that prognostic estimates of advanced cancer patients tend to be overly optimistic.^{4–5,8} Other evidence suggests that patients may misinterpret or fail to absorb information

provided by physicians, and some patients prefer to delay or even to evade prognostic discussions.^{10–12} Moreover, patients may have had prognosis discussions, but are unwilling to acknowledge their mortality and instead take avoidant coping strategies.

Many patients reported that their prognosis was "in God's hands" or that they did not know their prognosis. This may partly explain the low rates of prognosis awareness in our study. We cannot be certain if they were unable to articulate their prognosis because they had never discussed it, if they were unable to discuss it with their interviewer, or if they were referring to the inherent uncertainty of prognostication. Nonetheless, the association between most-important-doctors' propensity to discuss prognosis and patients' prognosis awareness was robust to several sensitivity analyses where we reclassified these responses.

Physicians' reports of their preferred timing of prognosis discussion based on the assumed vignette may be subject to social desirability bias and may not perfectly reflect the actual practices for their patients. The finding that few patients had prognosis awareness despite most physicians reported generally discussing prognosis early warrants further investigations on the quality of communications about prognosis between doctors and patients. Alternatively, some patients may have discussed prognosis early in the course of illness after diagnosis but not recall the discussion accurately, especially if they responded well to anticancer therapies.

The finding that patients who died within 90 days following their survey reported the highest prognosis awareness suggests that patients with advanced cancer may gradually perceive a poor prognosis as their physical condition deteriorates.²⁷ Otherwise, this finding may reflect the fact that many physicians tend to delay discussions about prognosis or end-of-life issues until patients' clinical circumstances get direr.^{9,16,17} Physicians' reluctance or delay in discussing prognosis may have negative consequences for patients with advanced cancer, such as unwanted aggressive treatment and delays in advance care planning.⁴

TABLE 3. SENSITIVITY ANALYSES FOR THE ASSOCIATION BETWEEN MOST-IMPORTANT-DOCTORS' PROPENSITY TO DISCUSS PROGNOSIS AND PATIENTS' PROGNOSIS AWARENESS^a

Subpopulations	n	Adjusted proportion with accurate prognosis awareness		Odds ratio	(95% CI)	p value
		Most-important-doctor discusses "now"	Most-important-doctor does not discuss "now"			
Patients having a survey response from their most-important-doctor	410	19.0	7.7	3.33	(1.17–9.53)	0.02
Patients who died within 2 years after diagnosis	399	24.6	7.7	4.23	(1.55–11.53)	0.005
Excluding patients who answered "in God's hands"	610	20.6	8.5	3.33	(1.39–7.97)	0.007
Excluding patients who answered "in God's hands" or "do not know"	361	31.4	17.6	2.74	(1.03–7.31)	0.04

^aModels were adjusted for physician specialty, age, sex, race, the number of terminally ill patients cared for by the surveyed physician in last year, cancer type, patient age, gender, race/ethnicity, marital status, speaking English at home, education, income, insurance, health maintenance organization enrollment, geographic region, receipt of chemotherapy, comorbidity, the number of days from diagnosis to interview, and the number of days from interview until death. Confidence intervals take into account the clustering of patients with physicians.

CI, confidence interval.

TABLE 4. PHYSICIANS' PROPENSITY TO DISCUSS PROGNOSIS VERSUS PATIENTS' PROGNOSIS AWARENESS IN THE MULTINOMIAL LOGISTIC MODEL^a

Role and response of the surveyed physician ^b	n	Inaccurate prognosis awareness	Accurate prognosis awareness		Do not know or “In God’s hands”	
		Adjusted proportion	Adjusted proportion	Odds ratio (95% CI)	Adjusted proportion	OddsRatio (95% CI)
Most-important-doctor does not discuss “now”	109	35.4	7.6	—	57.0	—
Most-important-doctor discusses “now”	301	38.6	18.4	3.17 (1.36–7.37)	42.9	0.51 (0.31–0.83)
Not most-important-doctor does not discuss “now”	79	39.4	17.1	2.85 (1.19–6.82)	43.5	0.52 (0.29–0.94)
Not most-important-doctor discusses “now”	197	30.6	18.9	3.29 (1.33–8.16)	50.4	0.73 (0.43–1.25)

^aModels were adjusted for physician specialty, age, gender, race, the number of terminally ill patients cared for by the surveyed physician in last year, cancer type, patient age, gender, race/ethnicity, marital status, speaking English at home, education, income, primary insurer, health maintenance organization enrollment, geographic region, receipt of chemotherapy, comorbidity, the number of days from diagnosis to interview, and the number of days from interview until death.

^bPhysicians reported their favored timing of prognosis discussion with a terminally ill patient who they believed to have 4–6 months to live.

CI, confidence interval.

Previous evidence suggested that surgeons and medical oncologists were more likely than noncancer specialists to report discussing prognosis earlier.¹⁷ In the CanCORS study, patients were asked to identify the physician who was most important in helping them to make decisions about their cancer. Although patients with cancer most often identified a medical oncologist as their most-important-doctor, physician specialty was not associated with patients' prognosis awareness after adjusting for other physician/patient factors, highlighting the importance of understanding better the roles rather than specialties of physicians in end-of-life care for patients with cancer. Nevertheless, we observed that patients whose physicians cared for more than 10 terminally ill patients in the last year were more likely to report an accurate prognosis awareness, suggesting that greater experience caring for terminally ill patients may improve physicians' prognosis communication.

Given the association between physicians' propensity to discuss prognosis and patients' prognosis awareness, the strikingly lower rate of reporting an accurate estimate of life expectancy among patients whose most-important-doctor did not report discussing prognosis "now" is particularly noteworthy. This suggests that some patients may be hindered from having an accurate understanding of their prognosis if the doctors whom they are relying on for their key decisions about their cancer tend to delay or are reluctant to discuss prognosis with them. It is also possible that patients who want to avoid prognosis discussions seek out physicians who avoid such discussions, implying "collusion" between patients with cancer and their physicians.²⁸

Important strengths of our study include the rich clinical and sociodemographic data from a large multiregional representative population and the linking of patient and physician data. Nevertheless, our study has several limitations. First, we could not directly investigate communication processes between doctors and patients because it was not feasible to audiotape clinical encounters or collect patient-specific information in the physician surveys. Second, only patients who were alive

and able to complete the interview themselves provided an estimate of their life expectancy. Therefore, the results cannot be generalized to patients who died soon after diagnosis or those who were too sick to complete the patient interview. Third, the multifaceted nature of the question on prognosis awareness may augment patients' overly optimistic responses. Fourth, we did not adjust for depression/anxiety, symptom burden, or response to prior chemotherapy, which could influence prognosis awareness. Finally, the linkage between patients and physicians was subject to nonresponse bias from patient and physician surveys, although prognosis awareness was similar between the study cohort and patients excluded because we had no survey data from their key physicians.

Conclusion

Prognosis awareness is an essential component of informed decision-making.^{4–6} Although increasingly, studies have documented that most patients want to receive prognostic information and that truthful communication is not harmful,^{7,11,12} in this large, population-based study of patients with metastatic lung or colorectal cancer, we found that many had a limited prognosis awareness soon after diagnosis, even though most of them had received chemotherapy. Our findings suggest that physician communication behaviors are associated with patients' perception of prognostic information. Identifying health care providers with important roles in cancer care and enhancing their communication skills may help to improve patients' understanding of their prognosis.^{13–15} Future research is needed to better understand the communication styles and content of prognosis discussions to maximize patients' understanding of their prognosis and improve the end-of-life care experiences for cancer patients.

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