

Prognostic Disclosure to Patients with Cancer near the End of Life

Elizabeth B. Lamont, MD, MS, and Nicholas A. Christakis, MD, PhD, MPH

Background: Patients' understanding of their prognosis informs numerous medical and nonmedical decisions, but patients with cancer and their physicians often have disparate prognostic expectations.

Objective: To determine whether physician behavior might contribute to the disparity between patients' and physicians' prognostic expectations.

Design: Prospective cohort study.

Setting: Five hospices in Chicago, Illinois.

Patients: 326 patients with cancer.

Intervention: Physicians formulated survival estimates and also indicated the survival estimates that they would communicate to their patients if the patients insisted.

Measurements: Comparison of the formulated and communicated prognoses.

Results: For 300 of 311 evaluable patients (96.5%), physicians were able to formulate prognoses. Physicians reported that they would not communicate any survival estimate 22.7% (95% CI,

17.9% to 27.4%) of the time, would communicate the same survival estimate they formulated 37% (CI, 31.5% to 42.5%) of the time, and would communicate a survival estimate different from the one they formulated 40.3% (CI, 34.8% to 45.9%) of the time. Of the discrepant survival estimates, most (70.2%) were optimistically discrepant. Multivariate analysis revealed that older patients were more likely to receive frank survival estimates, that the most experienced physicians and the physicians who were least confident about their prognoses were more likely to favor no disclosure over frank disclosure, and that female physicians were less likely to favor frank disclosure over pessimistically discrepant disclosure.

Conclusions: Physicians reported that even if patients with cancer requested survival estimates, they would provide a frank estimate only 37% of the time and would provide no estimate, a conscious overestimate, or a conscious underestimate most of the time (63%). This pattern may contribute to the observed disparities between physicians' and patients' estimates of survival.

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For author affiliations, current addresses, and contributions, see end of text.

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Forty years ago, physicians did not inform most patients with cancer of their diagnoses (1, 2). This practice of nondisclosure is now generally considered out of date, primarily because it may represent physician paternalism that compromises patient autonomy. Indeed, almost all patients with cancer are now informed of their diagnoses (3). Nevertheless, it is not clear how many understand the survival implications, that is, the associated prognosis. Because survival estimates often strongly affect decisions about cancer treatment, especially at the end of life, patients need and often rightly request prognoses when making such decisions (4-7).

Studies that compare physicians' prognostic estimates with those of patients often show a substantial discrepancy between the two. In a study of 100 patients with cancer who were undergoing treatment, Mackillop and colleagues (8) found that one third of those with metastatic cancer thought that they had local or regional disease and were being treated for cure. Similarly, Eidinger and Schapira (9) studied 190 patients being treated for incurable metastatic cancer and found that approximately one third thought that the treatment

would cure them. Weeks and colleagues (10), in their analysis of 917 patients with metastatic colon cancer or advanced non-small-cell lung cancer in the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments, found that patients who had optimistic misperceptions of their prognosis often requested medical therapies that most physicians would consider futile (10). Their study suggests that in patients with terminal cancer, optimistic prognostic estimates may lead to choices of invasive but ineffective medical therapies rather than perhaps more appropriate supportive care.

Previous studies do not clarify the reason for the asymmetry between comparatively optimistic survival estimates made by patients with cancer and the estimates made by their physicians. Do patients misinterpret or deny the poor prognoses that physicians give them? Do physicians think one thing about patients' prognoses but tell the patients something different? Although several factors may be operating simultaneously, some research suggests that at least part of the discrepancy may be due to the generally optimistic prognostic

estimates that physicians give their patients or to omission of prognostic discussions altogether (11).

Our principal objective was to evaluate how often physicians favor communicating frank survival estimates to patients with terminal cancer who request them. An additional objective was to examine how specific patient and physician characteristics are associated with physicians' preferences (that is, their stated intentions) for prognostic communication. To meet these objectives, we interviewed physicians from several specialties who referred their own patients with cancer to hospice terminal care. We asked them to provide us with their most accurate estimate of how long their patients had to live (*formulated prognosis*). We then asked them what they would tell their patients if the patients insisted on obtaining an estimate of how long they had to live (*communicated prognosis*). We compared these two survival estimates and sought to explain discrepancies by evaluating several patient and physician variables in which we had a substantive interest.

METHODS

Study Sample

We assembled a cohort of all patients with cancer admitted to five outpatient hospice programs in Chicago, Illinois, during 130 consecutive days in winter and spring 1996. We approached all hospices in the Chicago area that admitted more than 200 patients per year, at least 70% from within the Chicago city limits. Six hospices met these criteria, and five agreed to participate; we estimate that most hospice patients in Chicago were captured in our sample. Our research was approved by the institutional review board at each participating hospice and was conducted in accordance with the regulations of these boards. Participating hospices usually notified us about patients on the day of admission. We contacted referring physicians promptly to administer a 4-minute telephone survey about patient prognosis and to collect other information.

A total of 767 patients were referred by 502 physicians during the study period and consented to the study. The five hospices contributed 13%, 14%, 17%, 22%, and 34% of the sample, respectively. Of the 767 patients, 325 did not meet the entry criteria: Two hundred eighty-five had a noncancer diagnosis (an expected percentage based on national data) (12, 13), and 40 had

physicians who were not appropriate participants (that is, they had already responded to several previous cases in the study). Thirty patients died before we were notified of admission. Because they died within a few hours and their physicians' predictions of survival would be meaningless, we did not include them in our cohort. For the remaining 412 eligible patients, we reached 38 physicians (9.2%) after the patient had died (and therefore could not get a meaningful prognostic estimate); we reached 8 physicians (1.9%) before the patient died, but the physician declined to participate; and we failed to reach 40 physicians (9.7%). However, for these 86 patients, we obtained basic physician and patient information and time of death.

We therefore successfully completed surveys with physicians who cared for 326 of the 412 eligible patients (a completion rate of 79.1%). Our analytic sample consists of these 326 patients, who were referred by 258 physicians. When we compared the 326 patients with the 86 excluded patients, we did not find important differences in age, sex, ethnicity, cancer type, or disease duration or in their physicians' sex, practice experience, or specialty. While most participating physicians (83% [214 of 258]) referred only 1 patient, a small number referred more than 1 (range, 2 to 6 patients). The average number of patients per physician was 1.26.

Variables and Data Sources

We acquired information about patient age, sex, ethnicity, religion, marital status, cancer diagnosis, and comorbid conditions from the hospices. From the physician telephone survey, we obtained patients' Eastern Cooperative Oncology Group (ECOG) performance status scores (a measure of debilitation that ranges from 0 to 4) (14) and duration of illness. We obtained patients' dates of death from publicly available death registries or from the hospices. As of 30 June 1999, dates of death were known for 96% of the cohort (313 of 326). From the physician telephone survey, we also determined physicians' experience with similar patients and how well they knew the study patients (that is, the duration, recency, and frequency of their contact). From publicly available records, we determined physicians' specialty, years in practice, and board certification.

Our key questions involved 1) an estimate of the patient's prognosis (by asking the physicians to provide

“your best estimate of how long you think this patient has to live”) and 2) a comparable statement about what the physician would tell the patient if the patient or family insisted on receiving a specific estimate of survival. We refer to the first prognosis (the estimates of survival given to us by the physicians) as the *formulated prognosis* and the second prognosis (the estimates physicians would give to patients) as the *communicated prognosis*. By design, these two questions were separated by 20 questions that required approximately 2 minutes to answer. Although physicians were not reminded of their formulated prognosis when asked for the communicated prognosis, it was provided if they requested it. Physicians were not asked to explain discrepancies between their formulated and communicated prognoses. We also asked physicians to quantify their confidence in their formulated prognosis as a percentage, from 0% (no confidence) to 100% (complete confidence). The instrument is available from the investigators upon request.

Statistical Analysis

We created a multinomial disclosure variable capturing the four possible categories of prognostic disclosure that could result from comparison of the formulated and communicated prognoses. The categories were 1) no disclosure (the physicians formulated a prognosis for the investigators but would not communicate any temporally specific prognosis to the patient), 2) frank disclosure (formulated prognosis was the same as communicated prognosis), 3) optimistically discrepant disclosure (formulated prognosis was shorter than communicated prognosis), and 4) pessimistically discrepant disclosure (formulated prognosis was longer than communicated prognosis). To evaluate associations between the multinomial disclosure variable and categorical and continuous variables, we used chi-square tests and analysis of variance, respectively. We used multinomial logistic regression to model the multivariate effect of patient and physician variables on the intended strategy of prognostic disclosure (15). This type of model describes the relative odds, through conditional odds ratios, of being in one category compared with another (the omitted category, which was frank disclosure). Although 83% of physicians referred only one patient to the cohort, we adjusted our regression model to account for clustering of patients within physicians (16). All analyses were per-

formed by using Stata 6.0 (Stata Corp., College Station, Texas).

Odds ratios may present difficulties when used to characterize relationships, because they may seem to overstate the relative risk when the frequency of an outcome is high. Therefore, we used a variation of a method described elsewhere (17–19) to transform odds ratios into relative risks for selected key comparisons. These relative risks provide an additional, easier to appreciate characterization of the relationship between predictors of interest and the outcome being examined. Such relative risks depend on specified vectors of covariates and would change if different vectors were specified. Therefore, for illustrative purposes, we used the following fixed vector of covariate values, which were determined by their frequency (that is, mean, median, mode), to report the relative risk for intended disclosure behavior in physicians and patients: white female patient, 70 years of age, cancer diagnosis for 32 weeks, ECOG performance status score of 3, 43 weeks of follow-up, male general internist, physician in the lower 75% of practice experience, physician with more than 50% confidence in his or her prediction, physician who had referred fewer than two patients to a hospice in the past quarter, eight previous contacts between the patient–physician pair, and last physical examination 7 days before referral. We then performed selected comparisons of this vector and vectors that differed by one covariate to calculate relative risks. These differing covariate values are as follows: 60-year-old patient, patient with an ECOG performance status score of 2, female physician, physician in the upper quartile of practice experience, physician with less than 50% confidence in his or her prediction, physician with experience treating 13 similar patients, and physician referring two or more patients to a hospice in the previous quarter

Role of the Funding Sources

The funding sources had no role in the collection, analysis, or interpretation of the data or in the decision to submit the paper for publication.

RESULTS

Table 1 provides descriptive information about the patient and physician sample. The mean age of patients was 69.2 years (range, 19.6 to 98.1 years); 39.6% were

Table 1. Characteristics of 326 Terminally Ill Hospice Patients and Their Physicians

Variable	Complete Sample (n = 326)	Frank Disclosure (n = 111)	No Disclosure (n = 68)	Optimistic Disclosure (n = 85)	Pessimistic Disclosure (n = 36)
Patient characteristics					
Mean age (range), y	69.2 (19.6–98.1)	71.5	65.9	70.0	66.0
Male sex, %	39.6	33.3	44.1	42.4	41.7
Ethnicity, %					
White	51.8	50.4	48.5	58.8	55.6
African American	19.6	23.4	16.2	20.0	19.4
Asian	2.2	1.8	1.5	1.2	2.8
Hispanic	4.3	1.8	5.9	3.5	5.6
Unknown	22.1	22.5	27.9	16.5	16.7
Marital status, %					
Married	43.4	39.6	55.4	35.8	45.7
Single	16.7	16.0	18.5	16.0	17.1
Divorced	10.3	11.3	10.8	6.2	14.3
Widowed	29.6	33.0	15.4	42.0	22.9
Median disease duration, wk	32	32	32	32	32
Median performance status score*	3	3	3	3	2
Physician characteristics†					
Male sex, %	80.2	85.7	74.1	79.1	68.1
Median time in practice, y	17	15	19	18	14
Board certification, %	82.7	83.5	79.3	80.6	73.9
Specialty, %					
General internal medicine and geriatrics	37.0	42.9	33.3	39.4	33.3
Hematology–oncology	23.2	22.0	33.3	18.2	33.3
Other internal medicine	18.1	18.7	15.8	15.1	9.5
Family or general practice	13.8	11.0	10.5	18.2	14.3
Other	7.9	5.5	7.0	9.1	9.5
Median similar patients cared for in the past 12 months, n	3	3	4.5	3	5
Referred ≥2 patients to hospice in the past quarter, %	33.0	28.6	31.0	35.8	60.9
Median confidence in prediction, %	70.0	75	50	75	75
Patient–physician relationship					
Median duration, wk	43	32	39	78	52
Median contacts in past 3 months, n	8	7	10	7	10
Median time since last physical examination, d	7	7	7	7	7

* Performance status is measured on the Eastern Cooperative Oncology Group continuous scale of 0 to 4, with 0 indicating normal activity and 4 indicating completely bedbound.

† Because these characteristics are reported at the physician level, the frequencies of disclosure type are given only for the first patient the physician referred in the cohort ($n = 258$). For these characteristics, the column totals do not apply.

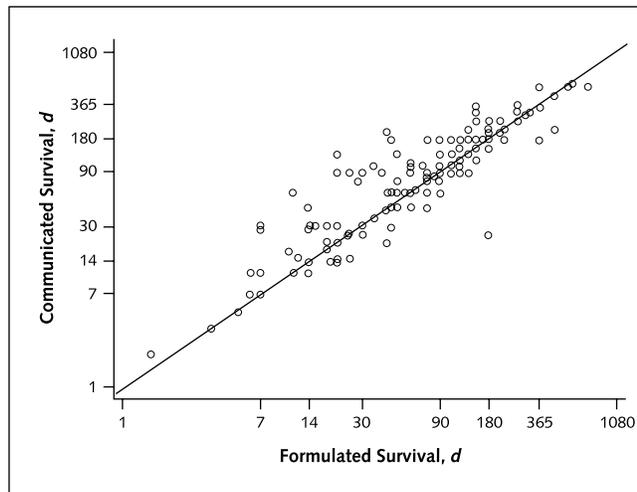
men; and the most frequent principal diagnoses were lung cancer (28.5%), colorectal cancer (10.7%), breast cancer (9.5%), and pancreatic cancer (8.0%). The median ECOG performance status score was 3 (corresponding to >50% of the day spent in bed).

The physicians had been practicing for a median of 17 years (range, 1 to 52 years), and 80.2% were men. Their specialty distributions were general internal medicine and geriatrics (37.0%), medical oncology (23.2%), nononcologic internal medicine subspecialties (18.1%), family practice or general practice (13.8%), and other (for example, surgeons or gynecologists) (7.9%). Although 23.2% of the physicians were medical oncologists, 31.9% of patients were referred by an oncologist,

since physicians could refer more than one patient in the cohort.

Of the 326 patients, 15 were missing data on prognostic disclosure. In 300 of the 311 remaining patients (96.5%), the physicians ($n = 241$) formulated prognoses and were willing to share them with us. However, physicians reported that in 22.7% (95% CI, 17.9% to 27.4%) of these cases (68 of 300), they would not communicate a temporally specific prognosis if asked by the patients to provide one. In 37% (CI, 31.5% to 42.5%) of these cases (111 of 300), physicians would communicate frank prognoses, and in 40.3% (CI, 34.8% to 45.9%) (121 of 300), they would communicate discrepant prognoses. Among the 121 patients who would have

Figure 1. Relationship between formulated and communicated survival.



The communicated survival and the formulated survival, in days, are shown for a cohort of 232 patients at the time of initiation of home-based hospice care. For the remaining 68 patients in our sample of 300, no prognosis would have been communicated. Not all points are visible because some may overlap precisely. The diagonal line represents frank disclosure. Patients above the diagonal line would receive knowingly overestimated survival information, and patients below the diagonal line would receive knowingly underestimated survival information.

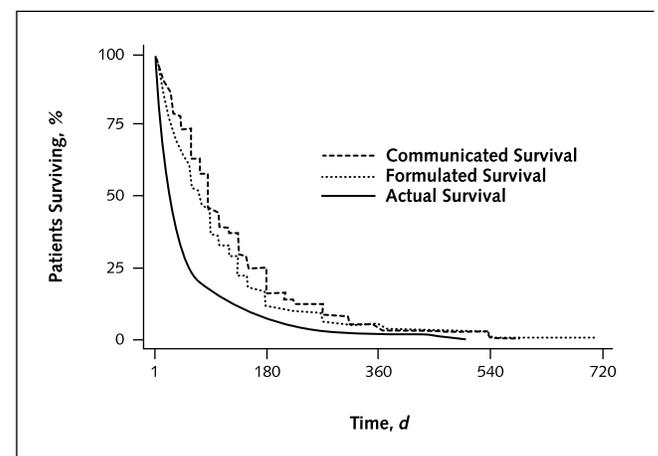
received discrepant prognostic estimates from their physicians, 70.2% (85 of 121) would have received optimistically discrepant prognoses and 29.8% (36 of 121) would have received pessimistically discrepant prognoses. In the 85 patients who would have received optimistically discrepant prognoses, physicians would have overestimated prognosis by a median of 31 days. For 24.7% of these patients (21 of 85), physicians would have overestimated prognosis by at least 60 days (range, 60 to 210 days). Analogously, for the 36 patients who would have received pessimistically discrepant prognoses, physicians would have underestimated prognosis by a median of 19 days.

Overall, the median formulated prognosis was 75 days and the median communicated prognosis (in the 232 patients who would have received one) was 90 days. Thus, physicians would have overstated their formulated prognoses to patients by a factor of 1.2 (90 days/75 days). **Figure 1** illustrates the relationship between the formulated and communicated prognoses among the 232 patients for whom physicians would communicate a prognosis. The median actual survival of this sample was 26 days, much shorter than either the formulated or the

communicated prognoses; given this short observed survival, physicians' communicated prognoses would have overstated actual survival by a factor of 3.5 (90 days/26 days). **Figure 2** illustrates the relationship between actual survival and the survival patterns based on the physicians' formulated and communicated prognoses.

Bivariate analyses showed that physicians' own estimates of their patients' survival horizons (their formulated prognoses) predicted their communicated prognoses. As shown in **Table 2**, patients who would have had an optimistically discrepant prognosis communicated to them or no prognosis communicated to them had the shortest anticipated survivals (81 days and 92 days, respectively), those who would have had frank prognoses communicated to them had intermediate anticipated survivals (117 days), and those who would have had pessimistically discrepant prognoses communicated to them had the longest anticipated survivals (128 days) ($P = 0.04$ for this group of comparisons). In sum, physicians' communication of prognoses was related to the prognoses they formulated. Various patient, physician, and patient-physician relationship variables were important and significant in bivariate analyses and were included in our multivariate model (data not shown). However, we did not include physicians' estimates of patient survival (formulated prognosis) in the multivariate model because it was used to define the out-

Figure 2. Relationship between communicated, formulated, and actual survival.



The differences between actual survival, formulated survival, and communicated survival in 300 terminally ill patients with cancer are shown. The median actual survival was 26 days, the median formulated survival was 75 days, and the median communicated survival was 90 days.

Table 2. Physicians' Prognostic Disclosure and Estimated Patient Survival*

Prognostic Communication Category	Mean Formulated Prognosis	Patients
	<i>d</i>	<i>n</i>
Optimistic prognosis	81	85
No disclosure	92	68
Frank prognosis	117	111
Pessimistic prognosis	128	36
Total		300

* For comparisons between physicians' mean formulated prognoses and their preferences for prognostic communication, $P = 0.04$.

come variable (20). Table 1 describes the variation of patient and physician attributes according to disclosure category.

Multinomial logistic regression revealed several factors associated with the four prognostic disclosure categories. Table 3 shows odds ratios (ORs) associated with

patient, physician, and patient-physician relationship variables. With increasing patient age, physicians were more likely to favor frank prognostic disclosure than to favor no disclosure or pessimistically discrepant disclosure. Each 10-year increase in age was associated with a 34% decrease in the relative odds of no disclosure (OR, 0.66 [CI, 0.48 to 0.91]). Based on typical covariate values, this corresponds to a relative risk (RR) of 0.74; hereafter, all reported RRs correspond to the typical covariate values. Each 10-year increase in age was also associated with a 40% decrease in the relative odds of a pessimistically discrepant disclosure (OR, 0.60 [CI, 0.40 to 0.91]; RR, 0.66). As patients' functional status declined, the likelihood of their physicians' favoring frank disclosure rather than pessimistically discrepant disclosure increased; with each incremental increase in numerical ECOG score (representing a decline in performance status), the relative odds that the patient's physician

Table 3. Association of Patient, Physician, and Patient-Physician Characteristics with Physician Preference for Prognostic Disclosure to Terminally Ill Patients with Cancer*

Characteristics	No Disclosure		Optimistic Disclosure		Pessimistic Disclosure	
	OR (95% CI)	RR	OR (95% CI)	RR	OR (95% CI)	RR
Patient						
Age (per decade)	0.66 (0.48–0.91)	0.74	0.85 (0.65–1.10)		0.60 (0.40–0.91)	0.66
Male sex	1.85 (0.90–3.80)		1.79 (0.92–3.47)		1.68 (0.55–5.17)	
Disease duration	1.00 (1.00–1.00)		1.00 (1.00–1.00)		1.00 (0.99–1.00)	
Performance status score	1.16 (0.78–1.71)		0.95 (0.68–1.31)		0.58 (0.36–0.92)	0.58
Physician						
Upper quartile of practice experience	2.90 (1.24–6.79)	2.34	1.18 (0.49–2.89)		0.94 (0.25–3.52)	
Female sex	2.96 (1.00–8.74)		2.67 (0.96–7.45)		16.96 (3.85–74.74)	9.00
<50% confidence in prediction	4.42 (1.54–12.65)	3.12	1.26 (0.38–4.16)		1.29 (0.22–7.53)	
Specialty						
Hematology-oncology	1.86 (0.64–5.45)		0.90 (0.36–2.21)		0.63 (0.15–2.72)	
Other internal medicine subspecialty	1.13 (0.38–3.40)		0.68 (0.25–1.86)		1.19 (0.31–4.60)	
Other specialties	1.99 (0.33–12.10)		1.21 (0.28–5.26)		0.63 (0.06–6.98)	
Family practice/general practice	1.04 (0.26–4.18)		2.08 (0.64–6.69)		1.60 (0.24–10.48)	
Cared for similar patients in past 12 months (10-patient increments)	0.98 (0.90–1.08)		0.99 (0.92–1.07)		1.11 (1.01–1.21)	1.11
Referred ≥ 2 patients to hospice in the past quarter	1.02 (0.42–2.47)		2.14 (1.05–4.34)	1.47	11.04 (3.12–39.14)	7.57
Physician-patient relationship						
Duration (10-week units)	1.01 (0.99–1.02)		1.01 (1.00–1.02)		1.01 (1.00–1.03)	
Number of contacts in past 3 months	0.99 (0.97–1.01)		0.98 (0.96–1.00)		0.97 (0.93–1.00)	
Days since last examination	0.99 (0.97–1.01)		0.99 (0.98–1.00)		0.94 (0.89–0.99)	

* The dependent variable has four categories: frank disclosure, no disclosure, optimistic disclosure, and pessimistic disclosure. The latter three are compared with the frank disclosure category. All dichotomous variables are coded as 0 = absent and 1 = present. This model also contained dummy variables indicating the hospices and the patient's ethnicity (white, black, other, or unknown), which are not shown. The omitted (reference) category for physician specialty is geriatrics-general internal medicine. Performance status is measured on the Eastern Cooperative Oncology Group (ECOG) continuous scale of 0 to 4, with 0 indicating normal activity and 4 indicating completely bedbound. Relative risk (RRs) for associations with significant odds ratios (ORs) were calculated by using the following covariate values: 60-year-old patient, patient with an ECOG performance status score of 2, female physician, physician in the upper quartile of practice experience, physician with less than 50% confidence in his or her prediction, physician with experience treating 13 similar patients, and physician referring two or more patients to hospice in the previous quarter. The baseline vector of covariates for RR determination is as follows: white female patient, 70 years of age, cancer diagnosis for 32 weeks, ECOG performance status score of 3, 43 weeks of follow-up, male general internist, physician in the lower 75% of practice experience, physician with more than 50% confidence in his or her prediction and with experience treating three similar patients, physician who had referred fewer than two patients to a hospice in the past quarter, eight previous contacts between the physician-patient pair, and last physical examination 7 days before referral.

would favor pessimistically discrepant disclosure over frank disclosure decreased by 42% (OR, 0.58 [CI, 0.36 to 0.92]; RR, 0.58).

Physicians in the upper quartile of practice experience had nearly three times the odds (OR, 2.90 [CI, 1.24 to 6.79]; RR, 2.34) of favoring no disclosure rather than frank disclosure. Female physicians were more likely to favor pessimistically discrepant disclosure (OR, 16.96 [CI, 3.85 to 74.74]; RR, 9.00) than frank disclosure. As physicians' confidence in their formulated prognoses decreased, their preference for no disclosure increased. For example, physicians whose confidence in their formulated prognoses was less than 50% had more than four times the odds of favoring no disclosure over frank disclosure (OR, 4.42 [CI, 1.54 to 12.65]; RR, 3.12). As physicians' experience with similarly ill patients increased (as measured by the number of recent similar patients or recent hospice referrals), so did their likelihood of favoring some form of nonfrank prognostic disclosure. For example, with each 10 similar patients cared for in the past year, the relative odds of the physician's favoring disclosure of a pessimistically discrepant prognosis increased by 11% (OR, 1.11 [CI, 1.01 to 1.21]; RR, 1.11). Similarly, physicians who had referred two or more patients to hospice programs in the past quarter had 11 times the odds of favoring pessimistically discrepant disclosure (OR, 11.04 [CI, 3.12 to 39.14]; RR, 7.57) and 2.14 (CI, 1.05 to 4.34; RR, 1.47) times the odds of favoring optimistically discrepant disclosure compared with physicians who referred fewer patients.

We evaluated for interactions between physician specialty and patient ethnicity and between physician specialty and physician sex but found no important or significant associations. The interaction terms were not included in the final model.

DISCUSSION

We found that physicians favored providing frank survival estimates only 37% of the time to patients with terminal cancer who had been referred for hospice palliative care and who might request such an estimate. Furthermore, physicians favored providing an apparently knowingly inaccurate survival estimate for 40.3% of patients and favored providing no survival estimate for 22.7% of patients. In short, for all of these patients, physicians were able and willing to formulate objective

prognoses, whether accurate or not, but had difficulty communicating them, even to insistent patients. These results suggest that part of the reported discrepancy between patients and physicians on the issue of prognosis may relate to physician nondisclosure or optimistic disclosure. In fact, the overall frequency of discrepant overestimation that we report (28%) is similar to that in previous reports, which found that approximately one third of patients with cancer overestimated their prognoses compared with their physicians (8, 9).

As shown in **Figure 2**, physicians' predictions contain both conscious and unconscious optimism. The survival prospects that physicians communicate to patients are more optimistic than the survival estimates they formulate, but even the latter are more optimistic than patients' actual survival. This finding regarding the accuracy of formulated prognoses is not the subject of the current study but has been examined in previous research (21–24). Our past work has shown that physicians' formulated prognoses were accurate only 20% of the time in patients referred for hospice palliative care (21). The fact that the formulated and communicated prognoses differ further supports the contention that these are distinct behaviors of physicians caring for patients near the end of life, that both are (independently) prone to error, and that both are relevant to the care patients might receive. These stepwise optimistic prognoses may cause patients to become twice removed from their actual survival. Although a median discrepancy of 15 days between the formulated and communicated prognoses may seem small, we believe that it is important for at least three reasons: 1) It may represent conscious physician behavior; 2) it is relatively large in our study, representing more than half of the true median survival of 26 days; and 3) it occurs in addition to an already overoptimistic formulated prognosis.

What accounts for this lack of support for explicit, frank verbal communication about prognosis to dying patients, even when the patients insist on such information? Several facts seem important. First, we found that physicians with less than 50% confidence in their predictions had four times the odds of favoring no disclosure over frank disclosure compared with more prognostically confident physicians. Some previous research has suggested that physician confidence is not associated with prognostic accuracy itself—that is, that physicians do not accurately perceive their own prognostic abilities

in formulating prognoses (25). Thus, although low confidence does not seem to be associated with prognostic accuracy, it appears to influence the nature of the prognostic communication by decreasing the physician's likelihood of communicating a prognosis to his or her patient.

Second, we found that physicians in the upper quartile of practice experience favor no disclosure over frank disclosure and that physicians with previous experience in the palliative care of dying patients favor disclosure of knowingly inaccurate pessimistic prognoses rather than frank prognoses. Additional research is required to clarify why increasing experience might discourage physicians from frank disclosure. One possibility is that the wisdom born of experience suggests to physicians that it is best not to provide patients with predictions. This seems especially likely given the error in physicians' formulated prognoses, as shown in **Figure 2** and elsewhere (21, 22). Experienced physicians may come to believe that since they cannot formulate reliable prognoses, why communicate them? They may also understand their propensity to err optimistically in formulated prognoses and try to correct for it by communicating more pessimistic prognoses to patients. However, older physicians may favor prognostic nondisclosure because of an age-period-cohort effect; the older physicians in our sample received their medical education and training in the 1950s and 1960s, a time when nondisclosure of cancer diagnoses was common, and this may explain their current disclosure styles (26).

Our study has several limitations. First, the assumption that physicians favored providing their patients with "knowingly inaccurate" prognoses when the formulated and communicated prognoses differed may be incorrect. The physicians may have forgotten the estimate given to the investigators earlier in the questionnaire, and the difference between what they told the investigators and what they would favor telling the patients may have been unintentional. The short interval between the two queries and the asymmetrical pattern of the discrepancies (optimistic communication substantially predominated) suggest otherwise, however. Second, our categorization of physician preferences for prognostic disclosure is based on a hypothetical situation in which a patient insists on receiving a temporally specific prognostic estimate; therefore, it may not reflect true clinical practice. Third, because the patients in our

sample had already been referred to hospice palliative care, an event that has prognostic implications, it is not known whether our results are generalizable to other populations. However, if physicians infrequently provide frank disclosure to hospice patients with cancer who request it, they may be even less likely to provide it to inquiring nonhospice patients, with or without cancer. Finally, although our response rate (79.1%) is higher than that of typical physician surveys (27), it is still less than 100%. This contributes to the potential for nonresponse bias and suggests that caution should be used when generalizing our results.

Our study has several implications. Previous studies have shown that patients usually want prognoses (4–6) and that they need them in order to make decisions that are most in keeping with their true preferences for end-of-life care (28, 29). Insofar as patients want and need prognoses, and insofar as the medical profession is committed to respecting patient autonomy, frank communication about prognosis between physicians and inquiring patients seems optimal. Clearly, however, communication of bad news needs to be handled tactfully and respectfully, and resources are available to guide physicians in this challenge (11, 30, 31). Our study should not be taken to support the deplorable practice of "truth dumping." Rather, we believe that physicians need to face the difficulties involved when seriously ill patients insist on temporally specific prognoses. Armed with such information, patients might be better able to plan for, and achieve, the kind of "good death" most Americans say they want (32, 33).

In general, we found that the propensity to avoid frank disclosure was relatively homogeneously distributed among patients and physicians. That is, most types of physicians tend to avoid frank disclosure for most types of patients with cancer. This has implications for the way we train physicians to break bad news about serious illness, since it suggests that no specific type of physician is prone to the behavior we have described and no specific clinical situation is most problematic.

However, if this type of enhanced communication between physicians and patients regarding prognoses at the end of life is to be of real use to patients, the medical profession will clearly need to improve the science of prognostication, allowing fewer errors in the formulated prognosis. What good does it do to encourage physicians to communicate information that is, after all, in-

accurate? Several methods are available for enhancing the accuracy of formulated prognoses, including using statistical algorithms, averaging prognoses made by several physicians, and consulting more experienced colleagues or textbooks (21, 34, 35).

Studies show that although patients with cancer want their physicians to provide detailed prognoses, they also want their physicians to give them good news and to be optimistic about their illnesses (4, 11, 36). The paucity of frank disclosure seen in our study, for patients in whom prognostic communication should theoretically present relatively few challenges, may indicate the impossibility of this task. Nevertheless, physicians report that they do not support frank disclosure for most patients with terminal cancer who request specific prognoses.

From University of Chicago Medical Center, Chicago, Illinois.

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Requests for Single Reprints: Nicholas A. Christakis, MD, PhD, MPH, University of Chicago Medical Center, 5841 South Maryland Avenue, MC 2007, Chicago, IL 60637; e-mail, nchrista@medicine.bsd.uchicago.edu.

Current Author Addresses: Drs. Lamont and Christakis: University of Chicago Medical Center, 5841 South Maryland Avenue, MC 2007, Chicago, IL 60637.

Author Contributions: Conception and design: N.A. Christakis. Analysis and interpretation of the data: E.B. Lamont, N.A. Christakis. Drafting of the article: E.B. Lamont, N.A. Christakis. Critical revision of the article for important intellectual content: E.B. Lamont, N.A. Christakis. Final approval of the article: E.B. Lamont, N.A. Christakis. Provision of study materials or patients: N.A. Christakis. Statistical expertise: E.B. Lamont, N.A. Christakis. Obtaining of funding: E.B. Lamont, N.A. Christakis. Administrative, technical, or logistic support: N.A. Christakis. Collection and assembly of data: E.B. Lamont, N.A. Christakis.

References

1. Fitts WT, Ravdin IS. What Philadelphia physicians tell patients with cancer. *JAMA*. 1953;153:901-4.
2. Oken D. What to tell cancer patients. A study of medical attitudes. *JAMA*. 1961;175:1120-8.
3. Novack DH, Plumer R, Smith RL, Ochitill H, Morrow GR, Bennett JM. Changes in physicians' attitudes toward telling the cancer patient. *JAMA*. 1979; 241:897-900. [PMID: 762865]
4. Kutner JS, Steiner JF, Corbett KK, Jahnigen DW, Barton PL. Information needs in terminal illness. *Soc Sci Med*. 1999;48:1341-52. [PMID: 10369435]
5. Degner LF, Kristjanson LJ, Bowman D, Sloan JA, Carriere KC, O'Neil J, et al. Information needs and decisional preferences in women with breast cancer. *JAMA*. 1997;277:1485-92. [PMID: 9145723]
6. Davison BJ, Degner LF, Morgan TR. Information and decision-making preferences of men with prostate cancer. *Oncol Nurs Forum*. 1995;22:1401-8. [PMID: 8539181]
7. Blanchard CG, Labrecque MS, Ruckdeschel JC, Blanchard EB. Information and decision-making preferences of hospitalized adult cancer patients. *Soc Sci Med*. 1988;27:1139-45. [PMID: 3206248]
8. Mackillop WJ, Stewart WE, Ginsburg AD, Stewart SS. Cancer patients' perceptions of their disease and its treatment. *Br J Cancer*. 1988;58:355-8. [PMID: 2460120]
9. Eidinger RN, Schapira DV. Cancer patients' insight into their treatment, prognosis, and unconventional therapies. *Cancer*. 1984;53:2736-40. [PMID: 6326993]
10. Weeks JC, Cook EF, O'Day SJ, Peterson LM, Wenger N, Reding D, et al. Relationship between cancer patients' predictions of prognosis and their treatment preferences. *JAMA*. 1998;279:1709-14. [PMID: 9624023]
11. Christakis NA. *Death Foretold: Prophecy and Prognosis in Medical Care*. Chicago: Univ of Chicago Pr; 1999.
12. Christakis NA, Iwashyna TJ. Impact of individual and market factors on the timing of initiation of hospice terminal care. *Med Care*. 2000;38:528-41. [PMID: 10800979]
13. Christakis NA, Escarce JJ. Survival of Medicare patients after enrollment in hospice programs. *N Engl J Med*. 1996;335:172-8. [PMID: 8657216]
14. Zubrod GC, Schneiderman M, Frei E, Brindley C, Gold GL, Shnider B, et al. Appraisal of methods for the study of chemotherapy in man: comparative therapeutic trial of nitrogen and mustard and triethylene thiophosphoramide. *Journal of Chronic Disease*. 1960;11:7-33.
15. Agresti A. *Categorical Data Analysis*. New York: J Wiley; 1990:205-11.
16. McCullagh P, Nelder JA. *Generalized Linear Models*. 2nd ed. New York: Chapman & Hall; 1999:125-9.
17. Altman DG, Deeks JJ, Sackett DL. Odds ratios should be avoided when events are common [Letter]. *BMJ*. 1998;317:1318. [PMID: 9804732]
18. Zhang J, Yu KF. What's the relative risk? A method of correcting the odds ratio in cohort studies of common outcomes. *JAMA*. 1998;280:1690-1. [PMID: 9832001]
19. Davies HT, Crombie IK, Tavakoli M. When can odds ratios mislead? *BMJ*. 1998;316:989-91. [PMID: 9550961]
20. Firebaugh G, Gibbs JP. User's guide to ratio variables. *American Sociological Review*. 1985;50:713-22.
21. Christakis NA, Lamont EB. Extent and determinants of error in doctors' prognoses in terminally ill patients: prospective cohort study. *BMJ*. 2000;320: 469-72. [PMID: 10678857]
22. Parkes CM. Accuracy of predictions of survival in later stages of cancer. *Br Med J*. 1972;2:29-31. [PMID: 4111472]

23. Forster LE, Lynn J. Predicting life span for applicants to inpatient hospice. *Arch Intern Med.* 1988;148:2540-3. [PMID: 3196122]
24. Evans C, McCarthy M. Prognostic uncertainty in terminal care: can the Karnofsky index help? *Lancet.* 1985;1:1204-6. [PMID: 2860399]
25. Connors AF, Dawson NV, Speroff T, Arkes H, Knaus WA, Harrell FE, et al. Physicians' confidence in their estimates of the probability of survival: relationship to accuracy [Abstract]. *Med Decis Making.* 1992;12:336.
26. Hobcraft J, Menken J, Preston S. Age, period and cohort effects in demography: a review. In: Mason WM, Fienberg SE, eds. *Cohort Analysis in Social Research: Beyond the Identification Problem.* New York: Springer-Verlag; 1985: 89-136.
27. Asch DA, Jedrzejewski MK, Christakis NA. Response rates to mail surveys published in medical journals. *J Clin Epidemiol.* 1997;50:1129-36. [PMID: 9368521]
28. Frankl D, Oye RK, Bellamy PE. Attitudes of hospitalized patients toward life support: a survey of 200 medical inpatients. *Am J Med.* 1989;86:645-8. [PMID: 2729313]
29. Murphy DJ, Burrows D, Santilli S, Kemp AW, Tenner S, Kreling B, et al. The influence of the probability of survival on patients' preferences regarding cardiopulmonary resuscitation. *N Engl J Med.* 1994;330:545-9. [PMID: 8302322]
30. Billings JA. Sharing bad news. In: Billings JA. *Outpatient Management of Advanced Cancer: Symptom Control, Support, and Hospice-in-the-Home.* Philadelphia: Lippincott; 1985.
31. Buckman R. *How to Break Bad News: A Guide for Health Care Professionals.* Baltimore: Johns Hopkins Univ Pr; 1992.
32. Steinhauser KE, Christakis NA, Clipp EC, McNeilly M, McIntyre L, Tulsky JA. Factors considered important at the end of life by patients, family, physicians, and other care providers. *JAMA.* 2000;284:2476-82. [PMID: 11074777]
33. Steinhauser KE, Clipp EC, McNeilly M, Christakis NA, McIntyre LM, Tulsky JA. In search of a good death: observations of patients, families, and providers. *Ann Intern Med.* 2000;132:825-32. [PMID: 10819707]
34. Knaus WA, Harrell FE, Lynn J, Goldman L, Phillips RS, Connors AF, et al. The SUPPORT prognostic model. Objective estimates of survival for seriously ill hospitalized adults. Study to understand prognoses and preferences for outcomes and risks of treatments. *Ann Intern Med.* 1995;122:191-203. [PMID: 7810938]
35. Poses RM, Bekes C, Winkler RL, Scott WE, Copare FJ. Are two (inexperienced) heads better than one (experienced) head? Averaging house officers' prognostic judgments for critically ill patients. *Arch Intern Med.* 1990; 150:1874-8. [PMID: 2393319]
36. Christakis NA, Iwashyna TJ. Attitude and self-reported practice regarding prognostication in a national sample of internists. *Arch Intern Med.* 1998;158: 2389-95. [PMID: 9827791]

I am very much against the inclusion of any cigarettes in the ration. Apart from the very real objection to the continuous coughing and expectorating they cause, they do, in fact, give rise to the very evils they are supposed to alleviate. They are supposed to soothe the nerves, and one cigarette undoubtedly has this effect, but the habit of smoking promotes irritability and makes its victim unable to do without it. Since, in campaigns of this nature, men cannot depend on a constant supply of cigarettes they are ill advised to pursue the habit. From my own experience the habit can be abandoned and not missed a month afterwards . . . Doctors' recommendations on this subject are biased as they are all inveterate smokers.

John Bierman and Colin Smith
Fire in the Night: Wingate of Burma, Ethiopia and Zion
New York: Random House; 1999:261

Submitted by:
A.M. Clarfield, MD, FRCPC
Sara Herzog Hospital
Jerusalem, Israel 91351

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