

Physician Factors Associated With Discussions About End-of-Life Care

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BACKGROUND: Guidelines recommend advanced care planning for terminally ill patients with <1 year to live. Few data are available regarding when physicians and their terminally ill patients typically discuss end-of-life issues. **METHODS:** A national survey was conducted of physicians caring for cancer patients about timing of discussions regarding prognosis, do not resuscitate (DNR) status, hospice, and preferred site of death with their terminally ill patients. Logistic regression was used to identify physician and practice characteristics associated with earlier discussions. **RESULTS:** Among 4074 respondents, 65% would discuss prognosis “now” (defined as patient has 4 months to 6 months to live, asymptomatic). Fewer would discuss DNR status (44%), hospice (26%), or preferred site of death (21%) immediately, with most physicians waiting for patient symptoms or until there are no more treatments to offer. In multivariate analyses, younger physicians more often discussed prognosis, DNR status, hospice, and site of death “now” (all $P < .05$). Surgeons and oncologists were more likely than noncancer specialists to discuss prognosis “now” ($P = .008$), but noncancer specialists were more likely than cancer specialists to discuss DNR status, hospice, and preferred site of death “now” (all $P < .001$). **CONCLUSIONS:** Most physicians report they would not discuss end-of-life options with terminally ill patients who are feeling well, instead waiting for symptoms or until there are no more treatments to offer. More research is needed to understand physicians’ reasons for timing of discussions and how their propensity to aggressively treat metastatic disease influences timing, as well as how the timing of discussions influences patient and family experiences at the end of life. *Cancer* 2010;116:000-000. © 2010 American Cancer Society.

KEYWORDS: end-of-life care, prognosis, hospice, physician survey.

Prior research has demonstrated large variations in the costs and aggressiveness of care delivered to patients with cancer and other chronic illnesses at the end of life.¹⁻³ Although such variation is not explained by differences in patients’ preferences for end-of-life care,⁴ it could be explained in part by physicians’ propensity to discuss end-of-life options with their terminally ill patients. Patients whose physicians discuss end-of-life options sooner might be more knowledgeable concerning strategies to improve the

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quality of the end-of-life experience and more interested in pursuing them based on this knowledge. Moreover, for patients who may prefer to avoid aggressive care at the end of life, physicians who discuss end-of-life options sooner might better understand these preferences and may be more likely to act on them.

National guidelines recommend advance care planning for patients with terminal illness and life expectancy of ≤ 1 year.^{5,6} Important components of such advance care planning include clear and consistent discussions about prognosis, information regarding advanced directives, exploration of the “do not resuscitate” (DNR) option, information about palliative care options including hospice, and elicitation of patients’ preferences for site of death.⁵ California recently enacted legislation requiring doctors to counsel patients whose prognosis is < 1 year about hospice and palliative care.⁷

Few data are available regarding when physicians and their terminally ill patients typically discuss end-of-life issues. We surveyed physicians caring for cancer patients to describe their reports of the timing of discussions about prognosis, DNR status, hospice, and preferred site of death with their terminally ill patients. We then assessed physician demographic, professional, and practice characteristics associated with their reports of the timing of these discussions. Finally, we assessed whether physicians who were more knowledgeable or comfortable addressing end-of-life issues were more likely than other physicians to discuss these topics while patients were still feeling well.

MATERIALS AND METHODS

Study Design

This study is part of a large multiregional study examining processes and outcomes of care for a population-based cohort of cancer patients conducted by the Cancer Care Outcomes Research and Surveillance (CanCORS) Consortium.⁸ The cohort includes $> 10,000$ patients diagnosed with lung or colorectal cancer between 2003 and 2005 living in Northern California, Los Angeles County, North Carolina, Iowa, or Alabama, or who received their care in 1 of 5 large health maintenance organizations (HMOs) or 15 Veterans Health Administration sites. Data were collected from patient (or surrogate) interviews, medical records, surveys of patients’ physicians,

and surveys of informal caregivers. The study was approved by the human subjects committees at all participating institutions. This analysis uses data from the physician survey only.

Study Population

As described previously,⁹ we surveyed physicians identified by patients participating in the CanCORS baseline interview as filling 1 or more key roles in their care, including providing surgery, chemotherapy, or radiation therapy (or discussing these treatments for patients who were not treated); referring patients to these key providers; helping to make treatment decisions; or knowing if the patient had symptoms related to their cancer or its treatment. Of 6871 physicians whose contact information was verified, 4188 (61.0%) responded.

Survey Instrument

To assess timing of discussions regarding end-of-life issues, 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 months 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 the following with this patient or family? 1) prognosis, 2) DNR status, 3) hospice, 4) preferred site of death.” Response options were “now,” “when the patient first has symptoms,” “when there are no more nonpalliative treatments,” “only if the patient is hospitalized,” and “only if the patient or family bring it up.” At the time of the survey administration, national guidelines^{5,6} recommended discussion of these topics with terminally ill patients having a life expectancy of ≤ 1 year.

In addition, we asked physicians how strongly they agreed or disagreed with the following statement^{10,11}: “I believe I am knowledgeable enough to discuss options for end-of-life care with my cancer patients and their families.” Response options were strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, and strongly disagree. Physicians also provided information regarding the number of terminally ill patients they cared for in the past year and personal and practice characteristics.

Table 1. Characteristics of Participating Physicians (N = 4074)

Characteristic	Value
Specialty (%)	
Surgeon	21.6
Medical oncologist	13.3
Radiation oncologist	5.9
Noncancer specialist	59.3
Mean age (SD), y	50.1 (9.8)
Men, %	81.7
Race, %	
Non-Hispanic white	71.4
Hispanic	3.2
Asian	20.6
Black	2.9
Other	2.0
Board certified, %	92.0
US/Canadian medical graduate, %	83.6
Participation in teaching, %	
None	54.8
1-5 d/mo	25.0
≥6 d/mo	20.2
Practice site, %	
Office (not hospital-based)	68.7
Hospital	31.3
Median percentage of patients in managed care (IQ range)	50 (20-84)
Median No. of terminally ill patients cared for in last year (IQ range)	12 (5-30)
Study site, %	
Northern California	22.2
Los Angeles County	25.0
Alabama	13.3
Iowa	10.8
North Carolina	11.6
5 health maintenance organizations	9.3
Veterans Health Administration	7.7

SD indicates standard deviation; IQ, interquartile range.

Statistical Analysis

We excluded 114 physicians who did not respond to all 4 questions regarding discussions about end-of-life issues. We used multiple imputation to impute missing data for remaining items.^{12,13} Item nonresponse was <2% to 3% for most variables, but was 7% for the proportion of patients enrolled in managed care.

We described physicians' reports of discussing prognosis, DNR status, hospice enrollment, and preferred site of death. We used chi-square tests to compare reports of discussing each option "now" by physician characteristics. We used logistic regression to identify physician factors associated with having discussions "now." Independent variables that we believed may be related to timing of dis-

cussions included self-reported physician specialty (surgeon, medical oncologist, radiation oncologist, noncancer specialist [predominantly primary care physicians, gastroenterologists, and pulmonologists; <1% were geriatricians, and <0.1% were palliative care specialists]), age (<40 years, 40-49 years, 50-59 years, ≥60 years), sex, race/ethnicity (white, Asian, black, Hispanic, other), board certification, US/Canadian medical graduate, practice site (office, hospital), teaching involvement (none, 1-5 days/month, >5 days/month), proportion of patients in managed care (quartiles), number of terminally ill patients cared for in the past year (quartiles), and study site. We calculated adjusted rates of discussing options "now" for each physician characteristic using a standardized regression approach.¹⁴

In a second set of models, we included variables reflecting whether physicians felt knowledgeable enough to discuss end-of-life options with their patients. Responses were categorized as strongly agree, somewhat agree, or other responses.

We conducted 2 sensitivity analyses. First, we changed the dependent variables in the models to "when the patient first develops symptoms" or "now" versus other options. Second, we repeated all analyses after restricting the cohort to physicians caring for at least 2 terminally ill patients in the past year (95% of physicians), because some physicians (particularly noncancer specialists) may have cared for cancer patients who did not die.

RESULTS

The mean age of the 4074 physicians was 50.1 years (standard deviation, 9.8), and 82% were men. Approximately 22% were surgeons, 13% were medical oncologists, 6% were radiation oncologists, and 59% were noncancer specialists. Characteristics of the cohort are included in Table 1.

Figure 1 depicts physicians' reports of when they would discuss prognosis, DNR status, hospice, and preferred site of death with their terminally ill patients, by specialty. Overall, 65% of physicians would discuss prognosis "now," whereas 15% would have this discussion only if the patient/family brings it up. Approximately 44% would discuss DNR status "now," with 18% waiting for the patient to have symptoms and another 26% waiting until there were no more nonpalliative treatments.

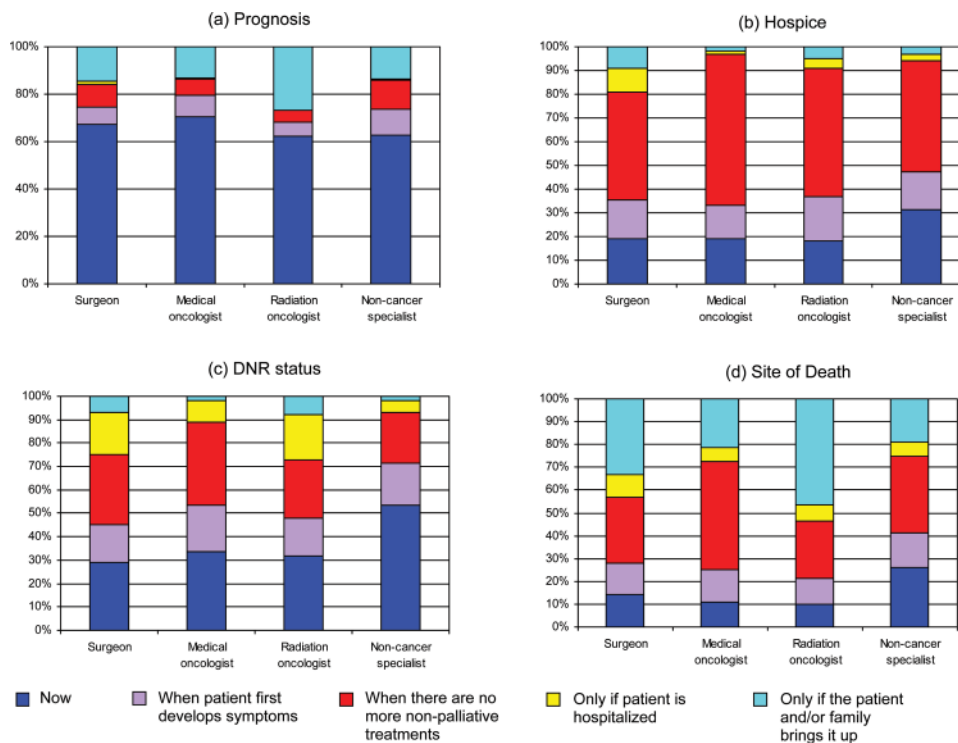


Figure 1. Timing of discussions regarding prognosis, do not resuscitate (DNR) status, hospice enrollment, and preferred site of death with terminally ill patients is shown by physician specialty. The panels present physicians’ reports of when they would discuss prognosis, DNR status, hospice enrollment, and preferred site of death with a patient who is newly diagnosed with metastatic cancer and who they believe has 4 to 6 months to live. Dark blue reflects the proportion responding “now”; purple reflects “when the patient first develops symptoms”; red reflects “when there are no more nonpalliative treatment options”; yellow reflects “only if the patient is hospitalized”; light blue reflects “only if the patient and/or family brings it up.”

Approximately one-quarter (26%) of physicians would discuss hospice “now,” with 16% waiting for symptoms and 49% waiting until there are no more nonpalliative treatments. Finally, 21% would discuss preferred site of death “now,” with 24% having this discussion only if the patient/family brought it up. Surgeons and medical oncologists were most likely to discuss prognosis “now,” whereas noncancer specialists were most likely to discuss the other topics “now.”

In multivariate analyses, surgeons and medical oncologists were more likely than noncancer specialists to report discussing prognosis “now” ($P = .008$), but non-cancer specialists were more likely than cancer specialists to discuss DNR status, hospice, and preferred site of death “now” (all $P < .001$) (Table 2). Younger physicians were more likely to report discussing prognosis, DNR status, hospice, and preferred site of death “now” (all $P < .05$). Female physicians were less likely than male physicians to report discussing prognosis “now” ($P = .05$), and physi-

cians with more terminally ill patients were more likely than others to report discussing prognosis ($P = .003$) and DNR ($P = .04$) “now.” Asian physicians were less likely than other physicians to report discussing prognosis “now,” and Hispanic physicians were most likely to discuss DNR status “now.” Physicians in office-based (vs hospital) practices were more likely to report discussing hospice “now” ($P = .007$). Physicians with the most patients in managed care were most likely to discuss DNR status and hospice “now” (both $P = .02$). Discussion of all treatment options were highest in the Veterans Health Administration and the HMO sites and were generally lowest in Los Angeles County and Alabama.

In a second set of multivariate models that included physicians’ reports of whether they felt knowledgeable enough to discuss end-of-life options with their terminally ill patients, physicians who strongly agreed (55% of physicians; odds ratio [OR], 1.89; 95% confidence interval [95% CI], 1.55-2.30) or somewhat agreed (30% of

Table 2. Adjusted Proportion Discussing Prognosis, DNR Status, Hospice, and Preferred Site of Death “Now” by Physician Characteristics^a

Characteristic	Prognosis		DNR Status		Hospice		Site of Death	
	Adjusted Proportion	P	Adjusted Proportion	P	Adjusted Proportion	P	Adjusted Proportion	P
Overall	64.7		44.4		26.2		20.5	
Specialty		.008		<.001		<.001		<.001
Surgeon	68.1		30.6		20.7		14.8	
Medical oncologist	68.3		31.9		17.8		9.8	
Radiation oncologist	60.2		32.5		19.2		10.1	
Noncancer specialist	63.2		53.4		30.6		26.2	
Physician age, y		<.001		<.001		<.001		.02
<40	72.6		52.9		30.9		24.2	
40-49	69.2		49.3		28.9		22.0	
50-54	64.9		41.3		26.0		19.5	
55-59	58.0		39.0		22.0		18.0	
≥60	55.0		35.9		20.8		17.8	
Sex		.045		.38		.56		.85
Men	65.4		44.1		26.0		20.6	
Women	61.4		45.9		27.0		20.3	
Race		.02		.052		.65		.54
White	66.2		43.3		26.1		20.5	
Asian	58.9		45.1		25.1		19.5	
Black	65.7		49.4		28.6		22.8	
Hispanic	66.6		55.1		30.5		25.7	
Other	65.4		52.6		28.9		22.1	
Board certified		.89		.82		.14		.69
No	65.1		45.0		29.7		21.4	
Yes	64.7		44.4		25.9		20.5	
US/Canadian medical graduate		.08		.87		.44		.65
No	61.4		44.8		27.6		21.3	
Yes	65.4		44.4		25.9		20.4	
Teaching		.43		.16		.34		.11
None	63.8		43.8		25.4		19.8	
1-6 d/mo	66.0		43.3		26.1		19.8	
>6 d/mo	65.7		47.7		28.4		23.6	
Practice site		.83		.25		.007		.21
Office (not hospital-based)	64.7		45.2		27.7		21.2	
Hospital	64.9		42.7		22.8		19.0	
Patients in managed care		.35		.02		.02		.12
≤20%	64.1		44.1		23.9		19.9	
21-49%	63.8		42.2		24.1		17.9	
50-78%	63.4		41.8		25.6		20.5	
≥78%	67.1		48.4		30.0		22.7	
No. of terminally ill patients cared for in last y		.003		.04		.59		.29
≤5	60.3		40.6		25.0		19.8	
6-14	63.6		44.8		25.5		19.5	
15-38	67.7		46.5		26.8		20.6	
≥39	68.4		46.3		28.1		23.7	
Study site		<.001		<.001		<.001		.04
Los Angeles County	60.0		39.4		20.2		18.5	
Northern California	67.9		46.1		25.4		20.0	
Alabama	57.8		39.8		27.3		19.5	
Iowa	65.8		46.5		28.6		19.9	
North Carolina	66.8		46.1		27.4		20.8	
5 health maintenance organizations	71.7		48.7		29.7		22.4	
Veterans Health Administration	70.0		53.3		36.6		28.3	

DNR indicates do not resuscitate.

^aEach model uses logistic regression to control for all variables (as categorized) in the table.

physicians; OR, 1.44; 95% CI, 1.18-1.76) were more likely than other physicians to discuss prognosis “now.” Physicians who strongly agreed they were knowledgeable to discuss end-of-life options were also more likely to discuss DNR status (OR, 1.94; 95% CI, 1.58-2.37), hospice (OR, 1.59; 95% CI, 1.27-2.00), and preferred site of death (OR, 1.60; 95% CI, 1.27-2.05) “now.” In all cases, addition of these variables to the base models did not influence the associations in Table 2.

When we restricted the sample to physicians who reported that they would discuss prognosis “now” to assess how often these physicians would use the discussion of prognosis as an opportunity to discuss other topics “now,” 57% also reported that they would discuss DNR status “now,” 36% that they would discuss hospice “now,” and 30% that they would discuss preferred site of death “now.”

In sensitivity analyses, we repeated analyses based on whether physicians discussed end-of-life issues “now” or “when the patient develops symptoms” versus other responses, and associations were generally similar (data not shown). Likewise, when we restricted the cohort to physicians caring for at least 2 terminally ill patients in the past year, our results were similar.

DISCUSSION

In this large survey of physicians caring for cancer patients who practiced in various locations across the United States, we found that many physicians report not discussing end-of-life options with terminally ill patients while they are still feeling well, and instead wait for onset of symptoms or until there are no more nonpalliative treatments to offer. A significant minority of physicians reported they would discuss prognosis or preferred site of death only if the patient or family brought it up. Younger physicians and physicians who were not cancer specialists reported discussing end-of-life options sooner than older physicians and cancer specialists, as did physicians caring for patients in HMO or Veterans Health Administration settings, compared with physicians whose patients were identified from population-based settings.

Although guidelines recommend advance care planning for terminally ill patients with a life expectancy of ≤ 1 year, a minority of physicians in our study reported that they would discuss DNR status, hospice enrollment,

or preferred site of death with patients who had 4 months to 6 months to live and were feeling well. There are several potential explanations for this finding. Physicians may disagree with the guidelines (which are based primarily on expert consensus due to limited data), may be unaware of the guidelines, or may agree with the guidelines but still delay discussions that may be difficult.

Few data are available regarding the benefits of advance care planning on patient- and family-centered measures.¹⁵ Although seriously ill patients, families, and physicians may agree about the importance of preparation for the end of life¹⁶ and value good communication about end-of-life care,¹⁷ little is known regarding patients' preferences regarding timing of discussions about end-of-life topics. Some reports suggest that patients prefer early discussions. For example, outpatients have suggested that advance care planning should occur when they are well, although ideally after the physician knows the patient.¹⁸

Nevertheless, not all patients want to discuss end-of-life issues early. An Australian study of metastatic cancer patients found that only 59% wanted to be told how long they had to live when first diagnosed.¹⁹ Indeed, some older individuals of certain ethnic groups do not believe patients should be informed that they have incurable cancer.²⁰ Uncertainty also exists about preferences for timing of discussions about DNR status. Some evidence suggests that most patients want to discuss DNR status with their physicians.²¹⁻²³ However, in the SUPPORT study, only 23% of patients had discussed DNR status with their physicians, and of those who had not, only 42% wished to discuss their preferences.²⁴ A small study of hospitalized cancer patients found that only 9% had discussed advance care preferences with their outpatient oncologist, and only 23% of the remaining patients reported wanting to do so, although 58% of patients supported policies requiring house staff to discuss advance care preferences at hospital admission.²⁵

Some physicians who are aware of the guidelines for advance care planning for terminally ill patients may delay end-of-life discussions because they fear that discussing death early in a patient's terminal course may be associated with less hope and poorer outcomes.^{26,27} However, studies examining outcomes after end-of-life discussions have demonstrated no harm or positive outcomes.^{28,29} Other physicians may have difficulty with end-of-life discussions because they perceive discussing end-of-life issues

as an admission of failure to cure a patient's cancer.^{30,31} Additional training may benefit physicians who felt less knowledgeable discussing end-of-life options, because they were less likely to report having these discussions early.

Our finding that many physicians reported waiting until there are no more nonpalliative treatments available before discussing end-of-life issues suggests that some physicians favor providing treatment for terminally ill patients before discussing end-of-life issues. This is consistent with the willingness of many terminally ill patients to undergo therapy despite a high treatment burden or a high likelihood of an undesirable outcome.^{32,33} However, physicians likely vary a great deal in their assessments of the availability of nonpalliative treatments and the number of regimens indicated,³⁴ and waiting until all possible treatments are exhausted may delay discussions until it is too late for patients' preferences and values to be addressed. In 1 study, only 41% of seriously ill patients who expressed a preference for comfort care believed that their medical care was consistent with that preference.³⁵ Given that use of chemotherapy at the end of life is increasing,^{3,36} even for cancers generally considered unresponsive to chemotherapy,³⁶ excessive treatment might delay discussions of end-of-life issues unnecessarily. Nevertheless, some physicians may defer hospice discussions because hospice care typically limits access to medical treatments.³⁷

Some physicians may delay discussions of end-of-life issues because they are uncertain about the accuracy of their estimates for life expectancy. Physicians consistently overestimate survival for terminally ill cancer patients, although their predictions are highly correlated with actual survival and have discriminatory ability even when inaccurate.³⁸ Still, even after formulating survival estimates (accurate or not), physicians often have difficulty communicating them, frequently providing intentionally inaccurate estimates or no estimates at all.³⁹ Yet, discussions of prognosis may be important, because terminally ill cancer patients' own estimates of prognosis are typically more optimistic than physicians' optimistic predictions.^{40,41} Patients' beliefs about prognosis influence their treatment preferences,⁴⁰ and may influence patients' likelihood of initiating discussions about goals when physicians do not. Such delays could contribute to unrecognized wishes. For example, patients who express a

preference to die at home are more likely to die at home than similar patients with wishes that are not expressed.^{42,43}

Although nearly two-thirds of physicians reported they would discuss prognosis "now" among this group, only half reported they would also discuss DNR status "now," and only one-third would discuss hospice or preferred site of death "now." This finding suggests that discussions of prognosis are not synonymous with advance care planning. Physicians may instead be using discussions of prognosis to initiate discussions about potential treatments.

Our finding that younger physicians were more likely than older physicians to discuss end-of-life options with their patients may reflect greater awareness of guidelines⁴⁴ or more emphasis on palliative care issues during their medical training. Alternatively, physicians who are older may have more experience with difficult end-of-life conversations and be more skeptical about the potential benefits. Our finding that physicians in HMO or Veterans Health Administration settings reported having end-of-life discussions sooner than physicians of patients in population-based settings may reflect a less-intensive approach to end-of-life care in these managed care models of care. Alternately, it may reflect the ability of integrated organizations to influence behavioral norms. Other evidence suggests greater hospice use in managed care systems⁴⁵ and less intensive end-of-life care for cancer patients in the Veterans Health Administration versus fee-for-service Medicare settings.⁴⁶ The geographic variations we observed for the population-based sites are consistent with other studies demonstrating large variations in care, particularly for situations in which few data are available to guide treatment recommendations.^{1,47}

Our analysis is strengthened by the large, geographically diverse sample of physicians from multiple disciplines who care for cancer patients. Nevertheless, our findings should be interpreted in light of several limitations. First, our vignette had a limited list of response options to determine when physicians would likely discuss end-of-life issues with a terminally ill patient, and responses to this vignette may not reflect reality. Our response options, for example, did not include an option such as "at the next visit, but before symptoms develop," which may have been a choice of physicians who may want to establish more of a relationship with their patients

before discussing sensitive end-of-life issues.⁴⁸ Second, because CanCORS participants are not a national sample, and our survey is subject to nonresponse bias, we cannot be certain that the physicians in our sample were representative of physicians caring for cancer patients nationally or in the regions studied. In addition, physicians' responses may have been influenced by social desirability bias; but the low prevalence of "now" responses suggests that social desirability was not the main determinant of responses. Finally, we surveyed only physicians and thus do not know the role of nonphysician providers in initiating end-of-life discussions with terminally ill patients.

In conclusion, despite guidelines recommending discussion of prognosis, DNR status, hospice, and preferred site of death with terminally ill patients while they are still feeling well, our findings suggest that different types of physicians have very different views regarding the appropriate timing of these discussions. More research, both quantitative and qualitative, is needed to understand physicians' reasons for the timing of their discussions, the role of physicians' propensity to aggressively treat metastatic cancer on the timing of discussions, and patients' preferences for timing and how timing influences patients' and families' experiences at the end of life. Education and patient, physician, and institutional interventions may be necessary to increase advance care planning for terminally ill cancer patients. Programs such as the Education for Physicians on End-of-Life Care-Oncology^{49,50} provide a promising model for influencing behavior change.

CONFLICT OF INTEREST DISCLOSURES

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REFERENCES

1. Wennberg JE, Fisher ES, Goodman DC, Skinner JS. Tracking the care of patients with severe chronic illness. The Dartmouth Atlas of Health Care 2008. Lebanon, NH: The Dartmouth Institute for Health Policy and Clinical Practice; 2008. Available at: http://www.dartmouthatlas.org/atlas/2008_Chronic_Care_Atlas.pdf Accessed April 13, 2008.
2. Foley KM, Gelband H, eds. Improving Palliative Care for Cancer. Washington, DC: National Academy Press; 2001.
3. Earle CC, Neville BA, Landrum MB, Ayanian JZ, Block SD, Weeks JC. Trends in the aggressiveness of cancer care near the end of life. *J Clin Oncol.* 2004;22:315-321.
4. Barnato AE, Herndon MB, Anthony DL, et al. Are regional variations in end-of-life care intensity explained by patient preferences? A Study of the US Medicare Population. *Med Care.* 2007;45:386-393.
5. National Comprehensive Cancer Network. Practice Guidelines in Oncology, v. 2.2005. Palliative Care. Available at: http://www.nccn.org/professionals/physician_gls/PDF/palliative.pdf Accessed May 14, 2007.
6. National Consensus Project for Quality Palliative Care. Clinical Practice Guidelines for Quality Palliative Care. Pittsburgh, PA: National Consensus Project for Quality Palliative Care; 2004. Available at: <http://www.nationalconsensusproject.org> Accessed May 14, 2007.
7. O'Reilly KB. California law mandates discussing end-of-life options. *Am Med News.* November 10, 2008. Available at: <http://www.ama-assn.org/amednews/2008/11/10/prsc1110.htm> Accessed December 17, 2008.
8. Ayanian JZ, Chrischilles EA, Fletcher RH, et al. Understanding cancer treatment and outcomes: the Cancer Care Outcomes Research and Surveillance Consortium. *J Clin Oncol.* 2004;22:2992-2996.
9. Keating NL, Landrum MB, Klabunde CN, et al. Adjuvant chemotherapy for stage III colon cancer: do physicians agree about the importance of patient age and comorbidity? *J Clin Oncol.* 2008;26:2532-2537.
10. Bradley EH, Cicchetti DV, Fried TR, et al. Attitudes about care at the end of life among clinicians: a quick, reliable, and valid assessment instrument. *J Palliat Care.* 2000;16:6-14.
11. Bradley EH, Cramer LD, Bogardus ST Jr, Kasl SV, Johnson-Hurzeler R, Horwitz SM. Physicians' ratings of their

- knowledge, attitudes, and end-of-life-care practices. *Acad Med.* 2002;77:305-311.
12. He Y, Zaslavsky AM, Harrington DP, Catalano PJ, Landrum MB. Imputation in a multiformat and multiwave survey of cancer care. *Statist Methods in Medical Rsrch.* In press.
 13. Little RJ. *Statistical Analysis With Missing Data.* New York, NY: John Wiley & Sons; 1986.
 14. Little RJ. Direct standardization: a tool for teaching linear models for unbalanced data. *Am Stat.* 1982;36:38-43.
 15. Lorenz KA, Lynn J, Dy SM, et al. Evidence for improving palliative care at the end of life: a systematic review. *Ann Intern Med.* 2008;148:147-159.
 16. 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;284:2476-2482.
 17. Curtis JR, Wenrich MD, Carline JD, Shannon SE, Ambrozy DM, Ramsey PG. Patients' perspectives on physician skill in end-of-life care: differences between patients with COPD, cancer, and AIDS. *Chest.* 2002;122:356-362.
 18. Miles SH, Koepf R, Weber EP. Advance end-of-life treatment planning. A research review. *Arch Intern Med.* 1996;156:1062-1068.
 19. Hagerty RG, Butow PN, Ellis PA, et al. Cancer patient preferences for communication of prognosis in the metastatic setting. *J Clin Oncol.* 2004;22:1721-1730.
 20. Blackhall LJ, Murphy ST, Frank G, Michel V, Azen S. Ethnicity and attitudes toward patient autonomy. *JAMA.* 1995;274:820-825.
 21. Reilly BM, Magnussen CR, Ross J, Ash J, Papa L, Wagner M. Can we talk? Inpatient discussions about advance directives in a community hospital. Attending physicians' attitudes, their inpatients' wishes, and reported experience. *Arch Intern Med.* 1994;154:2299-2308.
 22. Haas JS, Weissman JS, Cleary PD, et al. Discussion of preferences for life-sustaining care by persons with AIDS. Predictors of failure in patient-physician communication. *Arch Intern Med.* 1993;153:1241-1248.
 23. Shmerling RH, Bedell SE, Lilienfeld A, Delbanco TL. Discussing cardiopulmonary resuscitation: a study of elderly outpatients. *J Gen Intern Med.* 1988;3:317-321.
 24. Hofmann JC, Wenger NS, Davis RB, et al. Patient preferences for communication with physicians about end-of-life decisions. SUPPORT Investigators. Study to Understand Prognoses and Preference for Outcomes and Risks of Treatment. *Ann Intern Med.* 1997;127:1-12.
 25. Lamont EB, Siegler M. Paradoxes in cancer patients' advance care planning. *J Palliat Med.* 2000;3:27-35.
 26. Gordon EJ, Daugherty CK. "Hitting you over the head": oncologists' disclosure of prognosis to advanced cancer patients. *Bioethics.* 2003;17:142-168.
 27. Helft P, Hlubocky F, Wen M, Daugherty CK. Associations among awareness of prognosis, hopefulness, and coping in patients with advanced cancer participating in phase 1 clinical trials. *Support Care Cancer.* 2003;11:644-651.
 28. Song MK. Effects of end-of-life discussions on patients' affective outcomes. *Nurs Outlook.* 2004;52:118-125.
 29. Wright AA, Zhang B, Ray A, et al. Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. *JAMA.* 2008;300:1665-1673.
 30. Mount BM. Dealing with our losses. *J Clin Oncol.* 1986;4:1127-1134.
 31. Yabroff KR, Mandelblatt JS, Ingham J. The quality of medical care at the end-of-life in the USA: existing barriers and examples of process and outcome measures. *Palliat Med.* 2004;18:202-216.
 32. Fried TR, Bradley EH, Towle VR, Allore H. Understanding the treatment preferences of seriously ill patients. *N Engl J Med.* 2002;346:1061-1066.
 33. Matsuyama R, Reddy S, Smith TJ. Why do patients choose chemotherapy near the end of life? A review of the perspective of those facing death from cancer. *J Clin Oncol.* 2006;24:3490-3496.
 34. Harrington SE, Smith TJ. The role of chemotherapy at the end of life: "when is enough, enough?" *JAMA.* 2008;299:2667-2678.
 35. Teno JM, Fisher ES, Hamel MB, Coppola K, Dawson NV. Medical care inconsistent with patients' treatment goals: association with 1-year Medicare resource use and survival. *J Am Geriatr Soc.* 2002;50:496-500.
 36. Emanuel EJ, Young-Xu Y, Levinsky NG, Gazelle G, Sainina O, Ash AS. Chemotherapy use among Medicare beneficiaries at the end of life. *Ann Intern Med.* 2003;138:639-643.
 37. Wright AA, Katz IT. Letting go of the rope-aggressive treatment, hospice care, and open access. *N Engl J Med.* 2007;357:324-327.
 38. Glare P, Virik K, Jones M, et al. A systematic review of physicians' survival predictions in terminally ill cancer patients. *BMJ.* 2003;327:195.
 39. Lamont EB, Christakis NA. Prognostic disclosure to patients with cancer near the end of life. *Ann Intern Med.* 2001;134:1096-1105.
 40. Weeks JC, Cook EF, O'Day SJ, et al. Relationship between cancer patients' predictions of prognosis and their treatment preferences. *JAMA.* 1998;279:1709-1714.
 41. Haidet P, Hamel MB, Davis RB, et al. Outcomes, preferences for resuscitation, and physician-patient communication among patients with metastatic colorectal cancer. SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *Am J Med.* 1998;105:222-229.
 42. Gomes B, Higginson IJ. Factors influencing death at home in terminally ill patients with cancer: systematic review. *BMJ.* 2006;332:515-521.

43. Karlsen S, Addington-Hall J. How do cancer patients who die at home differ from those who die elsewhere? *Palliat Med.* 1998;12:279-286.
44. Choudhry NK, Fletcher RH, Soumerai SB. Systematic review: the relationship between clinical experience and quality of health care. *Ann Intern Med.* 2005;142:260-273.
45. McCarthy EP, Burns RB, Ngo-Metzger Q, Davis RB, Phillips RS. Hospice use among Medicare managed care and fee-for-service patients dying with cancer. *JAMA.* 2003; 289:2238-2245.
46. Keating NL, Landrum MB, Lamont EB, Earle CC, McNeil BJ. End-of-life care for older cancer patients in the Veterans Health Administration versus the private sector. *Cancer.* In press.
47. Wennberg JE, Cooper MM. *The Dartmouth Atlas of Health Care*, 1998. Hanover, NH: Center for Evaluative Clinical Sciences, Dartmouth Medical School; 1998.
48. Covinsky KE, Fuller JD, Yaffe K, et al. Communication and decision-making in seriously ill patients: findings of the SUPPORT project. The Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *J Am Geriatr Soc.* 2000;48:S187-S193.
49. Robinson K, Sutton S, von Gunten CF, et al. Assessment of the Education for Physicians on End-of-Life Care (EPEC) Project. *J Palliat Med.* 2004;7:637-645.
50. National Cancer Institute. Education for Physicians on End-of-Life Care-Oncology (EPEC-O). Bethesda, MD: National Cancer Institute; on December 17, 2007. Available at: <http://www.cancer.gov/aboutnci/epeco> Accessed on December 17, 2008.