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Availability and Integration of Palliative Care at United States Cancer Centers

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Abstract

Context—The current state of palliative care in cancer centers is not known.

Objective—We conducted a survey to determine the availability and degree of integration of palliative care services, and to compare between National Cancer Institute (NCI) and non-NCI cancer centers in the United States.

Design, Setting, and Participants—Between June and October 2009, we surveyed both executives and palliative care clinical program leaders, where applicable, of 71 NCI cancer centers and a random sample of 71 non-NCI centers regarding their palliative care services. Executives were also asked about their attitudes toward palliative care.

Main Outcome Measure—Availability of palliative care services in the cancer center, defined as the presence of at least one palliative care physician.

Results—We sent 142 and 120 surveys to executives and program leaders, with response rates of 71% and 82%, respectively. NCI cancer centers were significantly more likely to have a palliative care program (50/51 (98%) vs. 39/50 (78%), $P=0.002$), at least one palliative care physician (46/51 (90%) vs. 28/50 (56%), $P=0.04$), an inpatient palliative care consultation team (47/51 (92%) vs. 28/50 (56%), $P<0.001$), and an outpatient palliative care clinic (30/51 (59%) vs. 11/50 (22%), $P<0.001$). Few centers had dedicated palliative care beds (23/101 (23%)) or an institution-operated hospice (37/101 (36%)). The median reported durations from referral to death were 7 (Q1–Q3 4–16), 7 (Q1–Q3 5–10), and 90 (Q1–Q3 30–120) days for inpatient consultation teams, inpatient units, and outpatient clinics, respectively. Research programs, palliative care fellowships, and mandatory rotations for oncology fellows were uncommon. Executives were supportive of stronger integration and increasing palliative care resources.

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Conclusion—Most cancer centers reported a palliative care program, although the scope of services and the degree of integration varied widely. Further efforts to consolidate existing infrastructure and to integrate palliative care in cancer centers are warranted.

INTRODUCTION

While significant progress has been made in cancer treatment, approximately half of all cancer patients eventually die of their disease, and one third of cancer deaths happen within 6 months of diagnosis.¹ Palliative care outpatient clinics, inpatient consultation teams, palliative care units (PCUs) and hospices all play an integral role providing symptom control, psychosocial support and transition of care for cancer patients and their families along the cancer care continuum. Based on this understanding, multiple national and international organizations support early incorporation of palliative care into oncology practice.^{2–5} Most recently, the American Society of Clinical Oncology (ASCO) has taken a step further to support full integration of palliative care as a routine part of comprehensive cancer care in the United States (US) by 2020.⁶

The understanding that palliative care is most effective when incorporated early in oncology care led to the development of the comprehensive cancer care model, which integrates palliative care along with anticancer therapy from the time of diagnosis.^{7, 8} The current state of palliative care availability and degree of integration of palliative care services into oncology practice at various cancer centers in the US is unknown. Many cancer centers claim that they provide palliative care, although the structures, processes, and outcomes for their programs remain unclear. A more thorough picture of the level of palliative care that currently exists in these cancer centers would allow us to identify deficiencies and barriers to comprehensive cancer care, and to develop specific strategies to improve care delivery. In this survey study, we aimed to determine the availability and degree of integration of palliative care services in US cancer centers, as well as their executives' attitudes toward palliative care. We also compared palliative care services of National Cancer Institute (NCI)-designated cancer centers with those of non-NCI cancer centers.

PATIENTS AND METHODS

Survey Development

The Institutional Review Board at The University of Texas M. D. Anderson Cancer Center approved this study and waived the requirement for review and informed consent. Survey questions were generated after a comprehensive literature search, review of guidelines from the National Quality Forum,^{9, 10} and discussions among seven physicians (four medical oncologists, three palliative care specialists) with research interest in palliative oncology. Survey questions were generated based on the Donabedian tripartite division of structure, processes, and outcomes to evaluate the administrative, clinical, education, and research aspects of palliative care in cancer centers (eTable 1),¹¹ and subsequently reviewed for readability and face validity. The surveys were further revised by our institutional Patient-Reported Outcomes, Survey and Population Research (PROSPR) Shared Resource. Three physicians (DH, MDLC, DSZ) tested the final version of the surveys, and assessed the time required for completion.

Two surveys were utilized in this study. The first survey consisted of 22 questions and was directed to cancer center executives (eSurvey 1). This survey provided information regarding access to and attitudes toward palliative care. The second 74-question survey was sent only to cancer centers with palliative care programs (eSurvey 2). This survey asked palliative care program leaders details about their programs, including personnel, inpatient

PCUs, consultation teams, outpatient clinics, hospice, and educational and research activities.

Cancer Centers

Cancer centers in the US were identified by using the Commission of Cancer (CoC) database. The CoC accredits hospitals as cancer centers based on 36 standards that encompass a range of clinical, research, and quality improvement aspects of cancer care.¹² We obtained a list of 1482 CoC-accredited cancer centers, which represent approximately 30% of all American hospitals and provide services to approximately 70% of patients with new cancer diagnoses.¹³ Among these institutions, 71 were NCI-designated centers (40 NCI-designated comprehensive cancer centers, 15 NCI clinical cancer centers, and 16 NCI community cancer centers). The NCI designation is based on scientific excellence related to cancer prevention, diagnosis and treatment, and does not bear any specific reference to the quality of patient care or palliative care research. NCI-designated cancer centers are widely recognized as leading institutions in the US, and represent a well-defined cohort in previous studies.¹⁴ We surveyed all 71 NCI-designated cancer centers and a sample of 71 of 1411 non-NCI cancer centers using a simple randomization scheme.

Survey Process

We determined the names and contact information of cancer center executives through the CoC and NCI website, with independent verification through telephone contact. Information on palliative care program leaders was identified by calling the palliative care department directly. All respondents received an initial invitation with a mail survey, along with a \$10 gift certificate. They or their delegates were asked to complete the survey anonymously and to return it by mail, fax or electronically through a secured website. A reminder letter was sent to non-respondents at 2 weeks and 4 weeks, followed by a phone or e-mail reminder at 8 weeks. Data collection was performed between June and October 2009.

Response Rate Calculation

Response rates were determined following the metrics of the American Association for Public Opinion Research.¹⁵ The formula for calculation is shown here:

$$\text{Response rate} = (\text{complete responses} + \text{partial responses}) / (\text{complete responses} + \text{partial responses} + \text{non-response} + \text{explicit refusals} + \text{implicit refusals})$$

In this study, a complete response was defined as >80% of questions answered, a partial response as <80% of questions answered and completion of the key question in the corresponding survey regarding the availability of palliative care (Question IIB for the executive survey and Question IB for the palliative care program leader survey), and non-response as not answering the key question. Three of 120 palliative care program leader surveys sent were later found to be ineligible due to absence of palliative care programs in those centers, and were not included in the analysis.

Statistical Analysis

Our primary outcome was the availability of palliative care services in the cancer center, defined as the presence of at least one physician with dedicated time to the provision of palliative care (with or without board certification). We compared the proportions of NCI and non-NCI cancer centers that met this criterion using a binomial test. Given that we surveyed 71 NCI cancer centers and 71 non-NCI cancer centers with an anticipated response rate of 65% (therefore 46 evaluable NCI centers and 46 evaluable non-NCI cancer centers), we were able to declare as statistically significant a difference of 28% between groups, assuming a two-sided significance level of 0.05 and 80% power.

We summarized the availability of various types of palliative care services at different cancer centers using standard descriptive statistics, including medians, interquartile ranges, proportions, and frequencies, together with 95% confidence intervals where appropriate. Differences in services provided between NCI-designated cancer centers and non-NCI centers were computed using Fisher's exact tests for categorical variables. The Mann-Whitney test was used for nonparametric continuous variables. A *P*-value of <0.05 was considered to be statistically significant.

The Statistical Package for the Social Sciences (SPSS version 16.0, SPSS Inc., Chicago, Illinois) software and STATA (version 10.0, College Station, Texas) were used for statistical analysis.

RESULTS

Response Rates

Among the 140 executive surveys sent, we had 89 (63%) complete responses, 12 (8%) partial responses, 40 (28%) implicit refusals and 1 (1%) explicit refusal. The response rate was 101/140 (72%), and did not differ by cancer center type (NCI vs. non-NCI) nor whether the center had a palliative care program based on independent phone verification.

Among the 120 palliative care program leader surveys sent, the number of complete responses, partial responses, implicit refusals, explicit refusals and ineligible cases were 86 (72%), 10 (8%), 21 (15%), 0 (0%) and 3 (2%), respectively. The response rate was 96/117 (82%). Palliative care program leaders from NCI cancer centers were more likely than those from non-NCI centers to respond (61/67 (91%) vs. 35/50 (70%), *p*=0.007).

We did not detect any differences in CoC center type between the non-NCI cancer centers that were surveyed and those not surveyed (*p*=0.98).

Perceived Barriers and Attitudes towards Palliative Care

The barriers to delivery of palliative care identified by cancer center executives are shown in Figure 1. Poor reimbursement and limited institutional resources were the most commonly cited reasons. A small number of executives were concerned that the presence of palliative care could negatively affect their hospital mortality rate and national rating.

Cancer center executives rated their current pain and palliative care services favorably, and reported a significant improvement compared to 5 years ago (Table 1). Importantly, they strongly agreed that further integration of palliative care services into oncology practice will benefit patients, and that more funding should be directed toward palliative care research (Table 1). NCI cancer center executives were significantly more likely than their non-NCI cancer center counterparts to agree with an increase in palliative care resources at their institutions over the next 5 years.

Availability of Palliative Care Programs

A majority of responding cancer center executives reported an active palliative care program (Table 2). Compared to non-NCI cancer centers, NCI-designated cancer centers were significantly more likely to provide palliative care services, to have at least one palliative care physician, an inpatient consultation team and an outpatient clinic. Fewer centers had dedicated acute palliative care beds or an institution-operated hospice.

Palliative Care Clinical Services

Table 3 provides an overview of existing palliative care programs based on information provided by palliative care program leaders, including the range of services and personnel. Palliative care services have been in place at NCI cancer centers longer than at non-NCI cancer centers. Importantly, a majority of programs reported a short patient follow-up duration of less than 1 month.

While most palliative care teams had physicians (80%, 95% confidence interval (CI) 71–88%), mid-level providers (71%, 95% CI 62–80%), social workers (55%, 95% CI 45–65 %) and nurses (47%, 95% CI 37–58%), other healthcare professions were present in fewer than half of the cancer centers surveyed. Only one-third of palliative care program leaders identified their professional background as palliative care (Table 3). Board certification was not a requirement for physicians or nurses in a majority of programs (Table 3).

Table 4 provides further information about the structures and processes for the four main branches of palliative care services, including inpatient consultation teams, outpatient clinics, PCUs and institution-operated hospices. Inpatient consultation teams were not only the most common service, but also served a larger proportion of patients than PCUs and outpatient clinics. Importantly, the median duration from referral to death was 7 days (N=49, interquartile range 4–16 days) for inpatient consultation teams, 7 days (N=8, interquartile range 5–10 days) for palliative care units, and 90 days (N=11, interquartile range 30–120 days) for outpatient clinics. Notably, a large minority of programs with an outpatient clinic reported that they see patients in oncology clinics.

The inpatient consultation teams, outpatient clinics and PCUs were generally larger and served more patients at NCI cancer centers than at non-NCI cancer centers (Table 4). In contrast, NCI cancer centers were less likely to report an institution-operated hospice than non-NCI cancer centers, and had a smaller median daily hospice census.

Palliative Care Education

NCI cancer centers were more likely than non-NCI cancer centers to offer a palliative care fellowship program (Table 4). The fellowship programs were generally small, with few having five or more clinical fellows, and even fewer with research fellowships. Almost half of the responding programs provided training for mid-level providers. In NCI cancer centers, palliative care was a mandatory rotation for oncology fellows in a minority of programs (Table 4).

Palliative Care Research

Table 4 provides information regarding the availability of palliative care research programs and funding sources. Less than half of the respondents had research programs in place, even for NCI cancer centers.

DISCUSSION

Our survey provides up-to-date information on the availability and degree of integration of palliative care services in US cancer centers. Despite significant growth in the number of palliative care programs over the past decade,^{16–19} there remains much heterogeneity in the infrastructure and delivery of care in US cancer centers. Fewer than half of the palliative care programs were equipped with an outpatient clinic, PCU or hospice, and even fewer had fellowship and research programs in place. NCI cancer centers were more likely to offer palliative care services, particularly inpatient consultation teams and outpatient clinics, than non-NCI cancer centers. Cancer patients were referred to palliative care late in the disease

trajectory. Further efforts to consolidate existing infrastructure and to integrate palliative care in cancer centers are warranted.

Availability of Palliative Care

While a great majority of cancer centers reported the presence of a palliative care program, many of these programs were limited to providing inpatient consultation services, and only few centers had a PCU. While palliative care for many inpatients can be managed effectively through the consultation service, those with severe distress requiring intensive palliative care are best managed in a PCU under the care of an interprofessional team.^{20–22}

Fewer than half of the cancer centers offered palliative care outpatient services, although NCI cancer centers reported having more clinics in place. Given that oncology care is provided predominantly on an outpatient basis, the relative lack of palliative care outpatient clinics is an important finding. Palliative care clinics have the potential not only to significantly increase the number of referrals, but also to promote early access to integrated care. A novel outpatient model of integration involves palliative care personnel seeing patients at oncology clinics, which can potentially increase referral and enhance coordination and communication between oncology and palliative care teams.²³ Thirty percent of centers reported that they have combined oncology-palliative care clinics. The exact nature and outcomes of these clinics need to be further delineated.

Integration of Palliative Care

Almost all cancer center executives, who play a critical role in defining the future of cancer care, agreed that a stronger integration between palliative and oncology care is necessary. Early incorporation of principles of palliative medicine in cancer care has been shown to be associated with improved symptom control, quality of life, and transition to hospice care.^{24–26} Conversely, delayed referral significantly limits the effectiveness of palliation.^{27–29} Our survey revealed that palliative care patients were referred too late in the disease trajectory, a marker of limited access and integration.

How can we facilitate this important process of integration? First, healthcare professionals, patients and their families need to be educated on the benefits of palliative care and the concept of simultaneous care.³⁰ This can be accomplished through longitudinal discussions, mass media and integration of relevant materials into health professionals' educational curricula, scientific meeting programs and certification/recertification requirements.⁶ Second, increased availability of palliative care outpatient clinics can facilitate early referral. Third, oncologists should be encouraged to make early palliative care referrals and to participate regularly in family conferences and palliative care educational rounds, whereas palliative care specialists should start attending interdisciplinary cancer treatment rounds. Fourth, enhanced training of oncologists in core competencies related to palliative care can increase the overall quality of care and prompt more timely referrals to palliative care.⁶ Fifth, NCI should dedicate more resources toward research on integration models, with particular attention paid to the documentation of clinically important outcomes.³¹ The Institute of Medicine also recommended that "NCI should add the requirement of research in palliative care and symptom control for recognition as a Comprehensive Cancer Center."⁴ Finally, as highlighted in the executive survey, financial constraints remain the major obstacle to effective delivery of palliative care. It is prudent to advocate for increased resources and health policy changes through political engagement at the state and national levels.

Palliative Care Research and Education

The future of palliative care depends on research and education. Our study revealed the troublesome finding that few cancer centers have research programs available, and less than half offer palliative care fellowship programs and mandatory palliative care rotations for medical oncology fellows. Given the self-perceived lack of palliative care training among oncologists,^{32, 33} standardization and consolidation of palliative care in oncology fellowships is essential. To meet the anticipated growth in palliative care, the infrastructures for both research and education need to be developed further.

Limitations

This study has several limitations. First, we sampled only a small number of cancer centers, with some missing values. Second, responses from our survey could be biased, as they were based on recalled information and approximated data. Third, we surveyed only cancer centers approved by the CoC, and did not include any non-accredited hospitals. This may result in an overestimation of palliative care services in non-NCI cancer centers.¹² Fourth, there remains no gold standard for what constitutes a palliative care program, which could have affected how our respondents interpreted questions in the surveys. An operational definition of palliative care related to program infrastructure and/or staff qualifications would be helpful. Finally, although we addressed the surveys to the cancer center executives and palliative care program leaders, their delegates might have filled out the surveys instead. Nevertheless, in delegating this task, we believe that the executives/program leaders identified the most appropriate representatives for completing the surveys.

Conclusions

While most cancer centers now have a palliative care program, there remain significant gaps and delays in the delivery of care. To fulfill ASCO's vision of full integration of palliative care as a routine part of comprehensive cancer care by 2020,⁶ we urgently need to consolidate infrastructure such as outpatient clinics and PCUs, increase training of palliative care professionals and oncologists, conduct research on novel integration models and quality-improvement measures, educate patients and their families, and advocate for public health policy changes. Oncologists, palliative care specialists, executives and political leaders need to work closely together to ensure access to high-quality palliative care for all cancer patients in the US.

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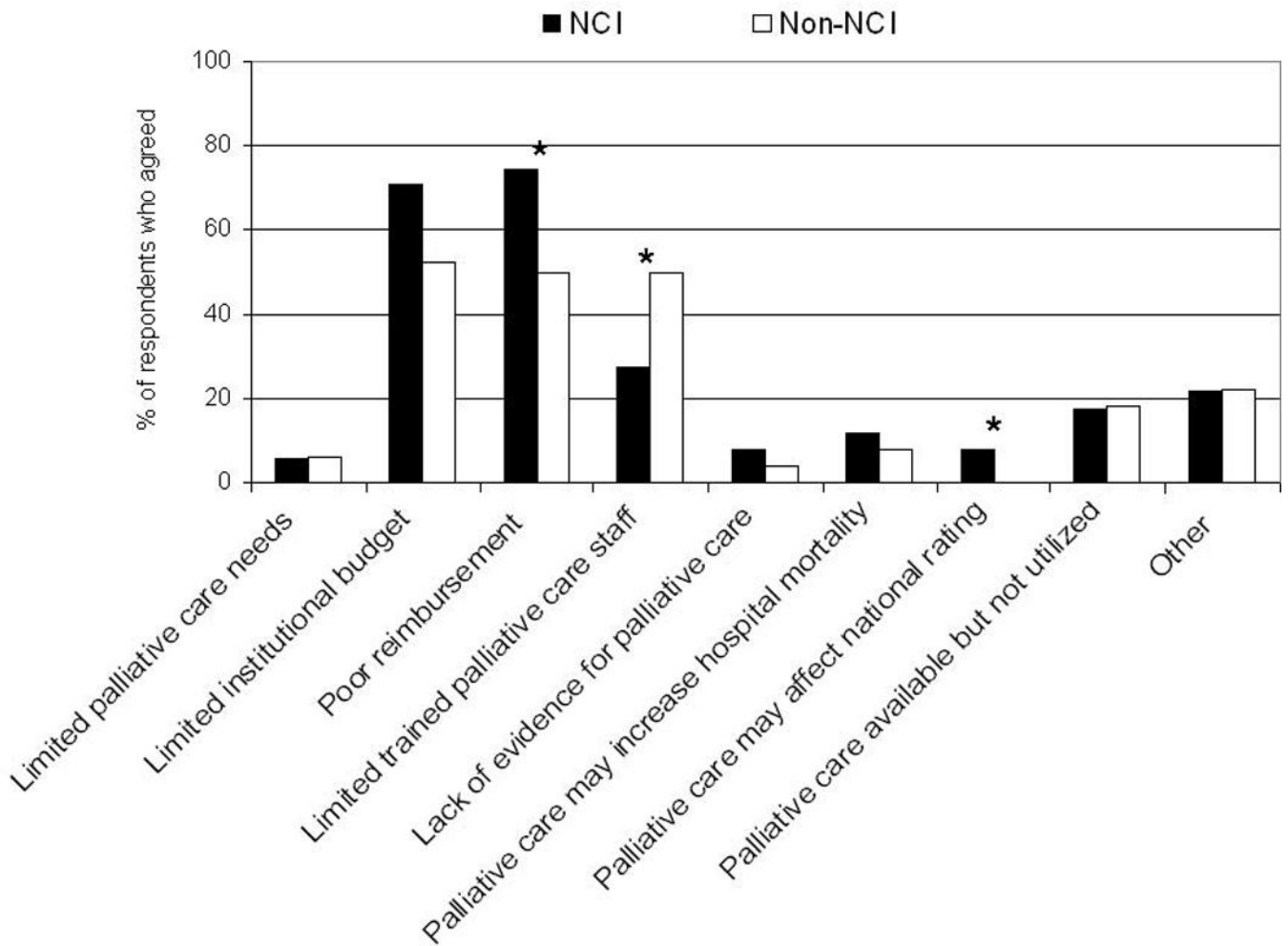


Figure 1. Perceived Barriers to Palliative Care Access According to Cancer Center Executives
 Perceived barriers to palliative care access based on the question “Irrespective of whether palliative care is offered at your institution, what in your opinion, are some of the potential barriers to palliative care access for your institution? (check all that apply)”. All 51 NCI and all 50 non-NCI executives who responded to the survey completed this question. * $P < 0.05$

Table 1

Attitudes of Cancer Center Executives towards Palliative Care

	Program Effectiveness 5 Years Ago			Program Effectiveness Now			<i>P</i> - value ^b
	N	%	95% CI (%)	N	%	95% CI (%)	
NCI Cancer Centers							
Pain management services	N=51 ^a			N=51 ^a			
Good or Excellent (7–10)	25	49	35–63	45	88	78–97	
Neutral (4–6)	20	39	26–54	5	10	3–22	<0.001
Poor (0–3)	6	12	4–24	1	2	0–11	
Unknown or not answered	0			0			
Palliative care services							
Good or Excellent (7–10)	15	30	18–45	40	80	68–91	
Neutral (4–6)	13	26	15–40	10	20	10–34	<0.001
Poor (0–3)	22	44	30–59	0	0	-	
Unknown or not answered	1			1			
Non-NCI Cancer Centers							
Pain management services	N=50 ^a			N=50 ^a			
Good or Excellent (7–10)	18	39	25–54	37	77	63–88	
Neutral (4–6)	24	52	36–66	11	23	12–37	<0.001
Poor (0–3)	4	9	2–20	0	0	-	
Unknown or not answered	4			2			
Palliative care services							
Good or Excellent (7–10)	9	20	10–35	27	57	42–72	
Neutral (4–6)	20	46	30–60	16	34	21–49	<0.001
Poor (0–3)	15	34	20–49	4	9	2–20	
Unknown or not answered	6			3			
	NCI Cancer Centers N=51^a			Non-NCI Cancer Centers N=50^a			
A stronger integration of palliative	N	%	95% CI (%)	N	%	95% CI (%)	

	Program Effectiveness 5 Years Ago			Program Effectiveness Now			<i>P</i> - value ^b
	N	%	95% CI (%)	N	%	95% CI (%)	
care services into oncology practice will benefit patients at my institution							
Agree or strongly agree (7–10)	46	90	79–97	44	92	80–98	<0.99
Neutral (4–6)	4	8	2–19	4	8	2–20	
Disagree or strongly disagree (0–3)	1	2	0–10	0	0	-	
Unknown or not answered	0			2			
More research funding should be directed towards palliative care services							
Agree or strongly agree (7–10)	43	84	71–93	39	81	67–91	0.28
Neutral (4–6)	6	12	4–24	9	19	9–33	
Disagree or strongly disagree (0–3)	2	4	0–13	0	0	-	
Unknown or not answered	0			2			
My institution will be increasing the number of palliative care physicians over the next 5 years							
Agree or strongly agree (7–10)	28	56	41–70	12	25	14–40	0.005
Neutral (4–6)	20	40	26–55	28	60	44–74	
Disagree or strongly disagree (0–3)	2	4	0–14	7	15	6–28	
Unknown or not answered	1			3			
My institution will be increasing the number of palliative care mid- level providers over the next 5 years							
Agree or strongly agree (7–10)	30	59	44–72	15	33	20–48	0.03
Neutral (4–6)	18	35	22–50	28	61	45–75	
Disagree or strongly disagree (0–3)	3	6	1–16	3	7	1–18	
Unknown or not answered	0			4			
My institution will be increasing the number of palliative care staff nurses over the next 5 years							
Agree or strongly agree (7–10)	26	52	37–66	13	27	15–42	

	Program Effectiveness 5 Years Ago			Program Effectiveness Now			<i>P</i> - value ^b
	N	%	95% CI (%)	N	%	95% CI (%)	
Neutral (4–6)	21	42	28–57	31	65	49–78	0.04
Disagree or strongly disagree (0–3)	3	6	1–17	4	8	2–20	
Unknown or not answered	1			2			
My institution will be increasing the number of palliative care acute beds over the next 5 years							
Agree or strongly agree (7–10)	16	33	20–48	8	17	7–30	
Neutral (4–6)	20	41	27–56	28	58	43–72	0.14
Disagree or strongly disagree (0–3)	13	27	15–41	12	25	14–40	
Unknown or not answered	2			2			
My institution will be increasing the funding for palliative care over the next 5 years							
Agree or strongly agree (7–10)	22	44	30–59	11	23	12–37	
Neutral (4–6)	26	52	37–66	29	60	45–74	0.03
Disagree or strongly disagree (0–3)	2	4	0–14	8	17	7–30	
Unknown or not answered	1			2			

Abbreviations: CI, confidence interval; NCI, National Cancer Institute

^aTotal number of respondents

^bComparisons were made between NCI and non-NCI cancer centers using the Fisher's exact test. Confidence intervals were computed using the exact binominal test. Missing values were not included in the analyses.

Table 2

Availability of Palliative Care Programs According to Cancer Center Executives

Cancer Center Characteristics	NCI Cancer Centers (N=51) ^a			Non-NCI Cancer Centers (N=50) ^a			P-value ^b
	N	%	95% CI (%) ^c	N	%	95% CI (%) ^c	
Type of Cancer Center							
NCI-designated Comprehensive Cancer Center	31	61	46-74	0	0	-	
NCI-designated Clinical Cancer Center	11	21	11-35	0	0	-	
NCI-designated Community Cancer Center	9	18	8-31	0	0	-	
Non NCI-designated Cancer Center	0	0	-	50	100	93-100	
Unknown or not answered	0			0			
Number of outpatients in 2008 (Q1-Q3)	10000		(2500-55000)	3002		(800-8400)	0.01
Unknown or not answered	12			16			
Inpatient beds available	41	87	74-95	30	67	51-80	0.02
Unknown or not answered	4			5			
Number of inpatient beds (Q1-Q3)^d	80		(44-400)	52		(20-300)	0.22
Unknown or not answered	13			23			
Palliative Care Program							
Available anytime over the last 10 years	50	98	90-100	39	78	64-88	0.002
Unknown or not answered	0			0			
Currently active	50	98	90-100	39	78	64-88	0.002

	NCI Cancer Centers (N=51) ^d		Non-NCI Cancer Centers (N=50) ^d		P-value ^b		
Unknown or not answered	0	0	0	0			
Palliative care physician present	46	92	79-97	28	74	57-87	0.04
Unknown or not answered	1	12					
Palliative Care Infrastructure							
Inpatient consultation team	47	92	81-98	28	56	41-70	<0.001
Unknown or not answered	0	0					
Outpatient clinic	30	59	44-72	11	22	12-36	<0.001
Unknown or not answered	0	0					
Dedicated palliative care acute care beds	13	26	14-40	10	20	10-34	0.64
Unknown or not answered	0	0					
Institution-operated hospice	16	31	19-46	21	42	28-57	0.31
Unknown or not answered	0	0					

Abbreviations: CI, confidence interval; NCI, National Cancer Institute; Q1-Q3, interquartile range

^aTotal number of respondents

^bComparisons were made between NCI and non-NCI cancer centers using the Fisher's exact test for categorical variables, and the Mann-Whitney test for continuous variables. Confidence intervals were computed using the exact binomial test. Missing values were not included in the analyses.

^cUnless stated otherwise

^dAmong centers with inpatient units only

Table 3

Palliative Care Program Characteristics According to Palliative Care Program Leaders

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P-value ^b
	N	%	N	%	
Time from Palliative Care Program Activation					
>5 years	30	51	37	64	9 27 13-46
Unknown or not answered	2		2		
Estimated Patient Follow-up Time					
1-7 days	20	34	22	47	14 43 25-61
>1-4 weeks	17	28	17	41	8 24 11-42
>1-12 months	17	28	17	41	9 27 13-46
>1 year	6	10	4	21	2 6 1-20
Unknown or not answered	1		2		
Professional Background of Palliative Care Leader^d					
Medical Oncology	10	17	8	29	6 18 7-35
Palliative Medicine	32	53	40	66	6 18 7-35
Nursing	5	8	3	18	10 30 16-49
Unknown or not answered	1		2		
Palliative Care Physician					
Number of full-time equivalent	1		(1-2)	1	(0-2) 0.07

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P- value ^b		
	N	%	N	%			
positions, median (Q1–Q3)							
Unknown or not answered	4		3				
Number of physicians with at least 20% of protected time, median (Q1–Q3)	0	(0–1.5)	0	0	0.047		
Unknown or not answered	1		2				
Professional Requirement							
Board certification for physicians^e	34	57	43–69	15	45	28–64	0.39
Unknown or not answered	1		2				
Board certification for nurses^f	19	32	20–45	8	24	11–42	0.49
Unknown or not answered	1		2				
Palliative Care Services^d							
Assessment and management of psychiatric disorders	29	48	35–62	11	33	18–52	0.193
Unknown or not answered	1		2				
Obtaining advanced directives/DNR orders	54	90	79–96	29	88	72–97	0.817
Unknown or not answered	1		2				
Ethical issues	44	73	60–84	29	88	72–97	0.121
Unknown or not answered	1		2				
Referrals to hospice, home care and other placements	55	92	82–97	30	91	76–98	>0.99

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P- value ^b
	N	%	N	%	
Unknown or not answered	1		2		
Comprehensive care plan	53	88	27	82	0.53
Unknown or not answered	1		2		
Pain consultation	57	95	61	94	>0.99
Unknown or not answered	1		2		
Psychosocial support	54	90	25	76	0.08
Unknown or not answered	1		2		
Symptom management	57	95	33	100	0.55
Unknown or not answered	1		2		

Abbreviations: CI, confidence interval; DNR, Do-not-resuscitate; NCI, National Cancer Institute; Q1–Q3, interquartile range

^aTotal number of respondents

^bComparisons were made between NCI and non-NCI cancer centers using the Fisher's exact test for categorical variables, and the Mann-Whitney test for continuous variables. Confidence intervals were computed using the exact binominal test. Missing values were not included in the analyses

^cUnless stated otherwise

^dMore than one option may apply

^eBased on the question "Does your palliative care program require physicians to be certified by the American Board of Hospice and Palliative Medicine or American Board of Medical Specialties?"

^fBased on the question "Does your palliative care program require nurses to be certified by the National Board for Certification of Hospice and Palliative Nurses?"

Structure and Processes of Palliative Care Clinical Services, Education and Research in Cancer Centers According to Palliative Care Program Leaders

Table 4

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P- value ^b
	N	%	N	%	
Consultation Service (N=83)^d	54	89	29	83	0.54
		95% CI		95% CI	
		(%) ^c		(%) ^c	
Availability					
24 hours/7 days per week	23	45	11	38	21-58
24 hours/weekdays only	4	8	3	10	2-27
Business hours/weekdays only	23	45	13	45	26-64
Other	1	2	2	7	1-23
Unknown or not answered	3		0		
Number of referrals/month, median (Q1-Q3)	47.5		30		(19-50)
Unknown or not answered	2		0		
Number of days from referral to death, median (Q1-Q3)	6		7		(4-10)
Unknown or not answered	26		8		
Palliative Care Units/Beds (N=27)^d	16	26	11	31	17-49
		95% CI		95% CI	
		(%) ^c		(%) ^c	
Physical unit present	9	69	4	40	12-74
Unknown or not answered	3		1		
Duration 3 years	11	92	7	70	35-93
Unknown or not answered	4		1		

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P- value ^b
	N	%	N	%	
Number of beds, median (Q1-Q3)	10.5	(4-12)	4	(4-6)	-
Unknown or not answered	4		6		
Number of discharges/month, median (Q1-Q3)	45	(30-50)	15	(11.5-26.5)	-
Unknown or not answered	7		3		
Median days from admission to death, median (Q1-Q3)	6	(3-21)	7	(6.3-7)	
Unknown or not answered	13		6		
Mortality rate, median (Q1-Q3)	40	(28-65)	43	(25-70)	
Unknown or not answered	5		2		
Outpatient Clinic (N=50)^d	40	66	10	29	0.001
Dedicated palliative care outpatient clinic	33	54	7	20	0.001
Unknown or not answered	0		0		
Patients seen in oncology clinics	14	23	4	11	0.19
Unknown or not answered	0		0		
Number of clinic days/week, median (Q1-Q3)	2	(1-4.5)	1	(.5-3.5)	0.46
Unknown or not answered	2		1		
Number of referrals/month, median (Q1-Q3)	14	(6-22.5)	7.5	(2-18)	0.08
Unknown or not answered	4		0		

	NCI Cancer Centers (N=61) ^d		Non-NCI Cancer Centers (N=35) ^d		P- value ^b
	N	%	N	%	
Number of days from referral to death, median (Q1–Q3)	90	(84–120)	41	(28–54)	-
Unknown or not answered	31		8		
Hospice (N=43)^d	19	31	24	69	0.001
Daily census, median (inter-quartile range)	20	(7–50)	85	(19.5–268)	0.03
Unknown or not answered	5		4		
Palliative Care Education					
Palliative care fellowship program	23	38	6	17	0.04
Unknown or not answered	0		0		
Fellows 5 in the program	4	18	1	17	>0.99
Unknown or not answered	1		0		
Training for mid-level providers	23	43	11	42	>0.99
Unknown or not answered	8		9		
Mandatory rotation for medical oncology	14	27	4	22	0.76
Unknown or not answered	10		17		
Mandatory rotation for radiation oncology	1	2	0	0	>0.99
Unknown or not answered	10		19		
Mandatory rotation for pediatric	3	6	0	0	0.57
Unknown or not answered			1–17		

	NCI Cancer Centers (N=61) ^d			Non-NCI Cancer Centers (N=35) ^d			P-value ^b
	N	%	95% CI (%) ^e	N	%	95% CI (%) ^e	
oncology							
Unknown or not answered	12			19			
Mandatory rotation for medical students	6	12	4–23	2	13	2–38	>0.99
Unknown or not answered	9			19			
Palliative Care Research							
Research programs	28	46	33–59	6	17	7–34	0.007
Unknown or not answered	0			0			
Receives research funding	19	70	50–86	4	80	28–99	>0.99
Unknown or not answered	1			1			
Peer reviewed grants	13	68	43–87	3	75	19–99	>0.99
Unknown or not answered	0			0			
Private foundations/philanthropy	12	63	38–84	3	75	19–99	>0.99
Unknown or not answered	0			0			
Funding source private industry	9	47	24–71	2	50	7–93	>0.99
Unknown or not answered	0			0			
Funding source institutional sources	8	42	20–67	3	75	19–99	0.32
Unknown or not answered	0			0			

Abbreviations: CI, confidence interval; NCI, National Cancer Institute; Q1–Q3, interquartile range

^aTotal number of respondents

^bComparisons were made between NCI and non-NCI cancer centers using the Fisher's exact test for categorical variables, and the Mann-Whitney test for continuous variables. Confidence intervals were computed using the exact binominal test. Missing values were not included in the analyses.

^cUnless stated otherwise