

## Predictors of Access to Palliative Care Services among Patients Who Died at a Comprehensive Cancer Center

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### ABSTRACT

**Purpose:** Palliative care services can decrease physical and psychosocial distress in patients with advanced cancer. However, most patients with cancer die without access to palliative care services (APCS), and patterns of referral are not well understood. The purpose of this study was to determine predictors of patients' access to palliative care.

**Patients and Methods:** We reviewed patient records from the computerized database at UT M. D. Anderson Cancer Center over 2 (2003 and 2004) to determine differences in characteristics and outcomes between patients with and without APCS. APCS was defined as a palliative care consultation and follow-up or transfer to the palliative care unit.

**Results:** A total of 499 of 1453 (34%) inpatients who died at our cancer center had APCS. There were no significant differences in race, age, or insurance status between the APCS groups. The two major predictors of a low rate of APCS were hematologic malignancies (20% rate of APCS versus 44% for solid tumors,  $p < 0.0001$ ) and intensive care unit (ICU) admission (15% versus 52% for non-ICU admission,  $p < 0.0001$ ). Patients with hematologic malignancies who were admitted to the ICU had the lowest APCS rate (10%,  $p < 0.0001$ ). The median relative cost of care per patient for decedents with APCS was 0.62 compared to nonreferred patients ( $p < 0.0001$ ).

**Conclusion:** APCS was lower among patients with hematologic malignancies and those admitted to the ICU. APCS resulted in a lower cost of care. Mortality in comprehensive cancer centers is quite variable among different primary malignancies. More research is needed to better define patterns of referral.

### INTRODUCTION

THE MAJORITY OF terminally ill patients with cancer in the United States die in acute care facilities.<sup>1-3</sup> In 2005, approximately 570,000 patients died of cancer.<sup>4</sup> Because of the availability of anticancer treatments and higher patient expectations, patients with cancer seek life-prolonging measures with growing regularity.<sup>5</sup> As patients live longer, the need for supportive and/or palliative care increases. In recent years, palliative care has become recognized as a major com-

ponent of cancer care in the United States,<sup>6,7</sup> but despite the rapid growth in palliative care services, the majority of general hospitals and cancer centers still do not have these services.<sup>8</sup> Even when palliative care services are present, many patients with cancer die without access to palliative care services (APCS), and the pattern of referral is not well understood. We have shown previously that approximately 35% of patients who died at The University of Texas M. D. Anderson Cancer Center during the fiscal years 2003 and 2004, were seen by our palliative care service.<sup>9</sup> We are not

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sure why the remaining 65% of the hospital decedents did not have APCS. The purpose of this study was to determine the characteristics of patients who had “versus” those that did not have access to palliative care in our comprehensive cancer center.

## PATIENTS AND METHODS

We conducted a retrospective review using the computerized database at M. D. Anderson Cancer Center to identify all in-hospital deaths during 2 fiscal years (2003 and 2004). Our Institutional Review Board approved the study.

M. D. Anderson Cancer Center is a 500-bed tertiary-care hospital. In 1999, a palliative care program was established at the institution. Methods were used to build referrals include extensive education sessions as well as direct communication with the primary oncologists about the program. In January 2002, an inpatient Palliative Care Unit (PCU) was established. Referrals to the PCU came primarily through transfers from other oncology inpatient services through the mobile consultation team, with fewer referrals coming via admissions from our palliative care ambulatory clinic and the Emergency Center.

At M. D. Anderson, patients are seen by a palliative care physician in the mobile consultation team or the ambulatory treatment center, upon request by the treating oncologist, to help with symptom management and/or to facilitate disposition to hospice care. Patients with severe symptoms or with significant psychological or family distress who require an interdisciplinary team approach are transferred to the PCU under the primary care of one of the palliative care physicians. The interdisciplinary team consists of a physician, fellows, an advance practice nurse (APN), a counselor, a chaplain, a social worker, physical and occupational therapists, and a pharmacist. The majority of the PCU patients (52%) are discharged to hospice after their symptoms are controlled.<sup>10</sup> The program maintains an ongoing contact with local hospices in the community through different activities that include monthly bus rounds.<sup>11,12</sup>

Patients (or their insurance companies) are billed for all services provided in the cancer center. At the time of transfer to the PCU, the billing code is changed from that of primary oncology services to palliative care services. We determined APCS prior to death by merging the files of patients who died in the hospital with the billing files of patients seen by the palliative care service. APCS was defined as either being under the primary care of one of the palliative care attending

physicians at the time of death or being under the primary care of an oncologist and being seen by the palliative care consultation team before death.

We collected the following information: demographic data, tumor type, and place of residence and compared it according to the patients' APCS. Primary tumors were further divided into hematologic malignancies (leukemia, lymphoma, multiple myeloma, and myelodysplastic syndrome) and solid tumors. We calculated median length of stay (MLOS) for all patients.

We determined which patients were admitted to the intensive care unit (ICU) at any time during admission by merging the files of patients who died in the hospital with the specific code for ICU admission.

We collected and compared the type of health insurance and the median cost of care per patient between patients who had APCS and those who did not for the final admission before death. We then determined the relative cost of care for patients with APCS versus those without APCS.

### *Statistical analysis*

Descriptive statistics were used to summarize the data. The Wilcoxon rank-sum test,  $\chi^2$  analyses, and univariate and multivariate logistic regression analyses were used to determine factors associated with APCS. For the univariate and multiple regression analyses, the variables of primary malignancy and insurance status were further categorized to primary malignancy (hematologic, thoracic head and neck, bone marrow transplantation [BMT], and other) and insurance status (commercial, government, other). We performed a backward selection multivariate regression analysis by initially including the variables of gender, Texas residence, primary malignancy, insurance status, ICU admission and race into the model, and then eliminated each variable that was nonsignificant in order of their non-significance until a final model was determined. A *p* value of < 0.05 was considered significant for all analyses.

## RESULTS

A total of 499 of 1453 (34%) patients had APCS before death. The median age of patients with APCS was 60 (*p* > 0.99), and there were more females than males with APCS. The majority of patients were white, and overall there were no differences in race between the two groups. The median length of stay (MLOS) was 10 days in patients who had APCS and 9 days in those with no APCS (*p* > 0.99). The percentage of

TABLE 1. DEMOGRAPHICS

Demographics	APCS (%)	Non-APCS (%)	Total	p value
Total no. of patients	499 (34)	954 (65)	1453	<0.0001
Median age (range)	60 (6–97)	60 (2–93)	—	0.71
Gender				
Female	246 (49)	411 (43)	657	0.02
Male	253 (51)	543 (57)	796	
Residential status				
Texas	419 (84)	697 (73)	1116	<0.0001
Non-Texas	80 (16)	257 (27)	337	
Ethnicity				
Black	60 (37)	104 (73)	164	0.70
White	355 (34)	698 (76)	1053	
Other	84 (36)	152 (74)	236	
Median length of stay (days) (Quartiles)	10 (6–18)	9 (3–21)	—	>0.99

APCS, access to palliative care services.

Texas residents was higher among patients who had APCS (419/499; 84%) than among patients with no APCS (697/954; 73%) ( $p < 0.001$ ). These results are shown in Table 1.

Figure 1 shows APCS according to the primary malignancy. Fewer patients with hematologic malignancies (105/586; 18%) had APCS compared with patients with solid tumors (378/867; 44%;  $p < 0.001$ ).

The majority of patients in both APCS groups had private insurance coverage. There was no significant difference in the type of primary insurance for patients who had APCS compared with those who did not (Fig. 2). The median cost of care per patient for patients

with APCS was approximately 62% less than that for patients without APCS ( $p < 0.001$ , using a Wilcoxon rank sum test). Figure 3 is a recursive partition analysis of ICU admission and primary malignancy. Of 693 patients admitted to the ICU, 107 (15%) had APCS, compared to 392 of 760 (51%) of patients who were not admitted to the ICU ( $p < 0.0001$ ). Patients with hematologic malignancies admitted to in the ICU had the lowest rate of APCS (34/399; 10%). In a multivariate analysis, only hematologic malignancy and ICU admission were predictive of APCS before death.

Twenty-one percent (107/499) of patients with APCS were admitted to the ICU at any time during

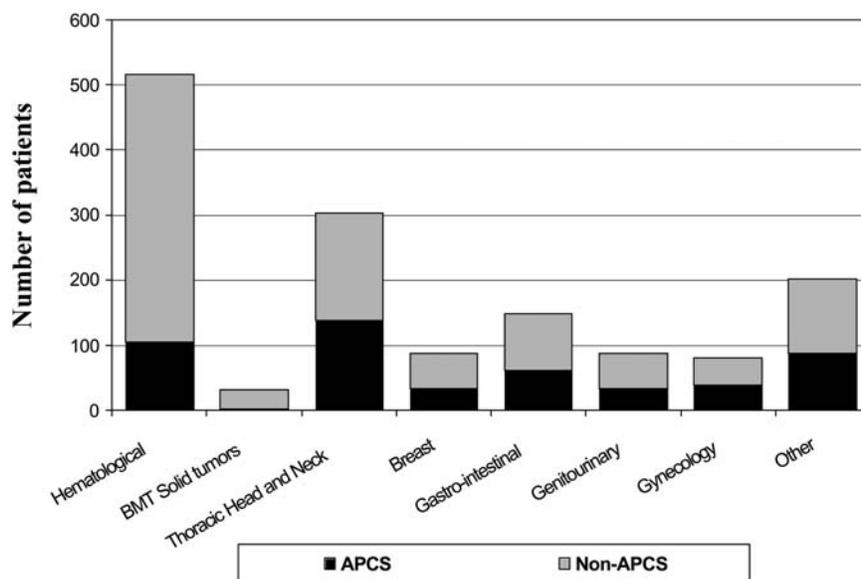


FIG. 1. Access to palliative care services (APCS) according to primary malignancy.

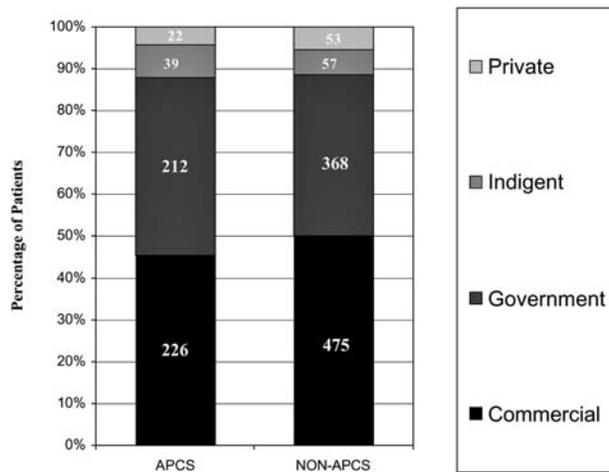


FIG. 2. Insurance coverage for patients with access to palliative care services (APCS) versus those without APCS ( $p > 0.99$ ).

their last hospital admission, compared with 586/954 (61%) of patients who did not have APCS ( $p < 0.001$ ).

### DISCUSSION

In this study, we found that admission to the ICU and hematologic malignancies were independent factors preventing APCS. We were not able to determine whether patients with APCS achieved better control of physical and emotional distress; however, there is ev-

idence that APCS results in improved symptom control.<sup>10,13</sup> In addition, critically ill patients with cancer in the ICU frequently express high levels of physical and emotional distress that can be alleviated by specialized palliative care team intervention.<sup>14</sup>

Patients with hematologic malignancies tend to have lower rates of access to palliative care services compared to solid tumors.<sup>15</sup> Studies of patients with hematologic malignancies admitted to the ICU reveal an in-hospital mortality rate approaching 65% for patients who required ventilatory support.<sup>16</sup> Even if such patients survive to hospital discharge, their overall survival is very limited. The cost per year of life gained is higher for patients with hematologic malignancies than for those with solid tumors. However, recent advances in the management of complications and improved survival of patients with hematologic malignancies admitted to the ICU might have played a role in the low APCS rate in this subset of patients.<sup>17-21</sup> Despite the fact that these interventions have significant physical and psychosocial effects on patients and caregivers,<sup>22-24</sup> it has been recognized in the literature that palliative care is not offered to these patients and their families.<sup>25,26</sup>

Maddocks et al.<sup>14</sup> compared the final month of life of patients with colorectal cancer, non-Hodgkin's lymphoma, or acute leukemia and found that fewer patients with hematologic malignancies were referred to palliative care and that more died in the acute care setting. All the leukemia patients died from an acute event

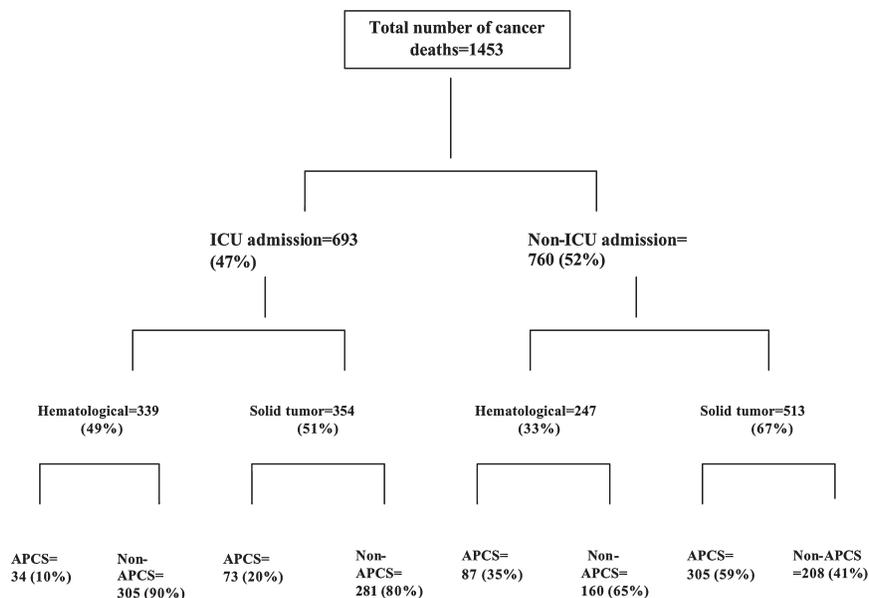


FIG. 3. Recursive partition analysis of access to palliative care services (APCS) according to intensive care unit (ICU) admission and hematologic analysis ( $p < 0.001$ ).

(i.e., hemorrhage or sepsis) in a major hospital, and only 27% of them had any contact with a palliative care service. In contrast, 75% of the patients with colorectal cancer and 61% of the patients with lymphoma were referred to a palliative care team. The symptom distress levels of all the patients were similar in Maddocks' study, arguing against a previous proposal that patients with hematological malignancies are not referred to palliative care because they have a lower symptom burden.<sup>27</sup>

In view of the recent advances in the treatment of hematologic malignancies and their complications, as well as the improvement in the ICU mortality rate of these patients, a model that integrates palliative care along with standardized and investigational treatment might facilitate earlier access to palliative care. Such models have been studied by Meyers et al.<sup>28</sup> and have found acceptance in cancer research settings.

We found no significant difference in APCS associated with the demographic variables age, race, and insurance status. This is in contrast to the previous finding that patients with black ethnicity have a higher chance of dying in an acute care facility.<sup>29</sup> Our findings also do not agree with a study in patients with breast cancer that suggested that age is a strong predictor of APCS, with older women with breast cancer having the highest APCS compared to middle-aged and younger women.<sup>30</sup> In a study done in Australia to determine the extent of coverage of patients with cancer by designated community palliative care services, there was no difference in coverage related to gender, socioeconomic status, residential area, or race. We, however, found that a higher percentage of Texas residents had APCS than did not.

In a systematic review of the literature regarding problems and issues in accessing specialist palliative care, Ahmed et al.<sup>31</sup> found evidence of a lack of education about palliative care among health care professionals, including physicians, nurses, and social workers, as well as among patients and caregivers. In that systematic review, patients who belonged to a minority group or who were older had lower rates of access to palliative care. The authors concluded that there is a need for more knowledge about palliative care among all these groups and that standardized criteria for referral to palliative care services should be developed.

In our previous study of the impact of palliative care services, we found a significant reduction in deaths in the ICU after the palliative care unit was established.<sup>9</sup> In the current study, patients who were referred for palliative care had lower rates of admission to the ICU. While a causative relationship cannot be inferred from

these findings, one explanation could be that palliative care services were helpful in providing an alternative place of death for critically ill, symptomatic patients who would have otherwise died in the ICU. However, an alternative explanation is that palliative care services were consulted because these patients were considered not appropriate ICU admission candidates. The SUPPORT study found no change in the percentage of ICU deaths following an educational intervention.<sup>32</sup> Our preliminary data after the opening of the palliative care unit<sup>9</sup> and our current results suggest that palliative care referrals may have impact in reducing ICU deaths. Further research is needed to clarify this point.

The overall cost for patients who accessed palliative care was lower. Patients who accessed palliative care and subsequently died in the palliative care unit continued to receive appropriate medical care, including intravenous hydration, intravenous antibiotics, anticoagulation therapy, and blood product transfusions, in addition to the symptom management and counseling of patients and their families.<sup>10</sup> This speaks to the feasibility of a model of an acute PCU where all appropriate interventions are offered to patients.

Our study has some limitations. Because of the retrospective data collection, we were not able to assess the impact of palliative care services on the physical and psychological distress of patients and families. Therefore, we are not able to conclude that increased involvement of the palliative care team resulted in improved symptom control and/or quality of life in patients and families. This study was conducted in a major referral center and it is not clear if these findings can be generalized to other populations such as community-based practices.

Our database does not allow us to clearly differentiate between patients admitted to surgical compared to medical services. However, because of the patterns of referral between services in our cancer center the vast majority of patients die under medical services. We are also unable to clearly determine how many of the hematological patients died on bone marrow as compared to hematologic or lymphoma services. However, most patients with hematologic malignancies in our institution die under the care of the primary leukemia or lymphoma services. These statements have also been added in the Discussion.

Also, it is not clear how many of the patients studied were candidates for palliative care service referral. More research is needed, preferably in a prospective setting, to clarify this point. Future research should also focus at determining APCS throughout the course of a cancer diagnosis, rather than just the terminal admission.

The cost of care was significantly higher among patients with no APCS. Our study cannot establish if this increase cost was related to continued therapy, inefficient palliation, or a combination of both. Future research should focus on better characterization of the cost of care among these patients.

In conclusion, we advocate for educational programs and pilot projects aimed at hematologic cancer and ICU health care professionals to identify the barriers to palliative care referral and facilitate the transition to palliative care in these patient populations. There has been a recent trend for end-of-life education and training of critical care practitioners.<sup>33,34</sup> Further research is needed to better define referral patterns and clinical outcomes of patients referred for palliative care and compare them with those of non-referred patients.

## REFERENCES

1. Bruera E, Sweeney C, Russell N, Willey JS, Palmer JL: Place of death of Houston area residents with cancer over a two-year period. *J Pain Symptom Manage* 2003;26:637–643
2. Gallo WT, Baker MJ, Bradley EH: Factors associated with home versus institutional death among cancer patients in Connecticut. *J Am Geriatr Soc* 2001;49:771–777.
3. Pritchard RS, Fisher ES, Teno JM, Sharp SM, Reding DJ, Knaus WA, Wennberg JE, Lynn J: Influence of patient preferences and local health system characteristics on the place of death: SUPPORT investigators study to understand prognoses and preferences for risks and outcomes of treatment. *J Am Geriatr Soc* 46:1242–1250, 1998
4. *Cancer Facts & Figures* 2005. Atlanta, GA: American Cancer Society, 2005, pp. 1–2.
5. 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.
6. Institute of Medicine: *Approaching Death: Improving Care at the End of Life*. Washington, D.C.: National Academy Press, 1997, pp. 87–119.
7. American Society of Clinical Oncology: Cancer care during the last phase of life. *J Clin Oncol* 1998;16:1986–1996.
8. Pan CX, Morrison RS, Meier DE, Natale DK, Goldhirsch SL, Kralovec P, Cassel CK: How prevalent are hospital-based palliative care programs? Status report and future directions. *J Palliat Med* 2001;4:315–324.
9. Elsayem A, Smith ML, Parmley L, Palmer L, Jenkins R, Reddy S, Bruera E, Impact of palliative care service on in-hospital mortality in a comprehensive cancer center. *J Palliat Med* 2006;9:894–902
10. Elsayem A, Swint K, Fisch MJ, Palmer JL, Reddy S, Walker P, Zhukovsky D, Knight P, Bruera E: Palliative care inpatient service in a comprehensive cancer center: Clinical and financial outcomes. *J Clin Oncol* 2004;22:2008–2014.
11. Bruera E, Selmser P, Pereira J, Brenneis C: Bus rounds for palliative care education in the community. *CMAJ* 1997; 157:729–732.
12. Bruera E, Fornells H, Perez E, Tattangelo M, Neumann CM: Bus rounds for medical congresses on palliative care. *Support Care Cancer* 1998;6:529–532.
13. Strasser F, Sweeney C, Willey J, Benisch-Tolley S, Palmer JL, Bruera E: Impact of a half-day multidisciplinary symptom control and palliative care outpatient clinic in a comprehensive cancer center on recommendations, symptom intensity, and patient satisfaction: A retrospective descriptive study. *J Pain Symptom Manage* 2004;27:481–491.
14. Maddocks I, Bentley L, Sheedy J: Quality of life issues in patients dying from haematological malignancies. *Ann Acad Med* 1994;23:244–248.
15. Hunt RW, Fazekas BS, Luke CG, Priest KR, Roder DM: The coverage of cancer patients by designated palliative services: A population-based study, South Australia, 1999. *Palliat Med* 2002;16:403–409.
16. Schapira DV, Studnicki J, Bradham DD, Wolff P, Jarrett A: Intensive care, survival, and expense of treating critically ill cancer patients. *JAMA* 1993;10;269:783–786.
17. Owczuk R, Wujtewicz MA, Sawicka W, Wadzyk A, Wujtewicz M: Patients with haematological malignancies requiring invasive mechanical ventilation: Differences between survivors and non-survivors in intensive care unit. *Support Care Cancer* 2005;13:332–338.
18. Benoit DD, Depuydt PO, Vandewoude KH, Offner FC, Boterberg T, De Cock CA, Noens LA, Janssens AM, Decruyenaere JM: Outcome in severely ill patients with hematological malignancies who received intravenous chemotherapy in the intensive care unit. *Intensive Care Med* 2006; 32:93–99.
19. Azoulay E, Recher C, Alberti C, Soufir L, Leleu G, Le Gall JR, Ferman JP, Schlemmer B: Changing use of intensive care for hematological patients: The example of multiple myeloma. *Intensive Care Med* 1999;25:1395–1401.
20. Azoulay E, Alberti C, Bornstain C, Leleu G, Moreau D, Recher C, Chevret S, Le Gall JR, Brochard L, Schlemmer B: Improved survival in cancer patients requiring mechanical ventilatory support: Impact of noninvasive mechanical ventilatory support. *Crit Care Med* 2001;29:519–5254.
21. Larch J, Azoulay E, Fieux F, Mesnard L, Moreau D, Thierry G, Darmon M, Le Gall JR, Schlemmer B: Improved survival of critically ill cancer patients with septic shock. *Intensive Care Med* 2003;29:1688–1695.
22. McGrath P: Caregivers' insights on the dying trajectory in hematology oncology. *Cancer Nurs* 2001;24:413–421.
23. Baker F, Curbow B, Wingard J: Role retention and quality of life of bone marrow transplant survivors. *Soc Sci Med* 1991;32:697–704.
24. Lesko L, Ostroff J, Mumma G, Mashberg D, Holland J: Long-term psychological adjustment of acute leukemia survivors: Impact of bone marrow transplantation versus conventional chemotherapy. *Psychosom Med* 1992;54: 30–47.
25. Mander T: Hematology and palliative care: an account of shared care for a patient undergoing bone marrow transplantation for chronic myeloid leukemia. *Int J Nurs Pract* 1997;3:62–66.

26. McGrath P: Palliative care for patients with hematological malignancies—If not, why not? *J Palliat Care* 1999;15:24–30.
27. Randall F: Terminal care in haematology. *Bailliere's Clin Haematol* 1987;1:581–591.
28. Meyers FJ, Linder J, Beckett L, Christensen S, Blais J, Gandara DR: Simultaneous care: A model approach to the perceived conflict between investigational therapy and palliative care. *J Pain Symptom Manage* 2004;28:548–556.
29. Bruera E, Russell N, Sweeney C, Fisch M, Palmer JL: Place of death and its predictors for local patients registered at a comprehensive cancer center. *J Clin Oncol* 2002;20:2127–2133.
30. Gagnon B, Mayo NE, Hanley J, MacDonald N: Pattern of care at the end of life: Does age make a difference in what happens to women with breast cancer? *J Clin Oncol* 2004;22:3458–3465.
31. Ahmed N, Bestall JC, Ahmedzai SH, Payne SA, Clark D, Noble B: Systematic review of the problems and issues of accessing specialist palliative care by patients, carers and health and social care professionals. *Palliat Med* 2004;18:525–542.
32. The SUPPORT Principal Investigators: A controlled trial to improve care for seriously ill hospitalized patients. The study to understand prognoses and preferences for outcomes and risks of treatments (SUPPORT). *JAMA* 1995;274:1591–1598.
33. Hough CL, Hudson LD, Salud A, Lahey T, Curtis JR: Death rounds: End-of-life discussions among medical residents in the intensive care unit. *J Crit Care* 2005;20:20–25.
34. Danis M, Federman D, Fins JJ, Fox E, Kastenbaum B, Lanken PN, Long K, Lowenstein E, Lynn J, Rouse F, Tullysky J: Incorporating palliative care into critical care education: principles, challenges, and opportunities. *Crit Care Med* 1999;27:2005–2013.

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