

# Late referral to palliative care consultation service: length of stay and in-hospital mortality outcomes

Jessi Humphreys, BS, and Stephanie Harman, MD

Department of Internal Medicine, Stanford University, California

**Background** Palliative care services in the United States are increasing in their prevalence but continue to vary in their implementation, with different referral policies and timing of patient access to services.

**Objective** To better define a late referral and to understand the association of late referrals to palliative care with patient health outcomes, including postreferral length of hospital stay and in-hospital mortality.

**Methods** We performed a retrospective study using multiple linear and logistic regressions on 1,225 patients with preexisting oncologic diagnoses who received a referral to Stanford Hospital's palliative care service.

**Results** Those oncologic patients who were referred to palliative care in the first week following admission had significantly shorter lengths of stay after referral, as well as lower in-hospital mortality, compared with patients who were referred later than 1 week following admission. Regression analyses, adjusted for demographic variables, DNR status, and sickness, revealed that waiting 1 week or longer to refer a patient was associated with an overall increased length of stay of 2.70 days ( $P < .001$ ). This increased to 3.40 days ( $P < .001$ ) when patients who died in the hospital were removed from the data, suggesting that in-hospital mortality was not solely responsible for the trend. Waiting 1 week to refer was associated with increased odds of a patient's dying in the hospital vs being discharged alive by a factor of 3.04 ( $P < .001$ ).

**Limitations** This study was limited to analyzing inpatient palliative care consultation services with a emphasis on patients with metastatic solid tumors. We used a proxy for patient sickness burden but did not analyze outcomes specific to cancer stage or individual oncologic diagnosis separately.

**Conclusions** Our study suggests that late referrals may have a marked negative impact on health outcomes, which argues for the design and implementation of hospital policies that encourage early referral to palliative care for advanced cancer patients.

Palliative care has been increasingly recognized as a crucial component of quality oncologic care. National guidelines state that the goals of palliative care are to prevent and relieve suffering, as well as to support the best possible quality of life for patients and their families, regardless of the stage of the disease or the need for other therapies.<sup>1</sup> The American Society of Clinical Oncology produced a provisional clinical opinion stating that palliative care should be combined with standard oncology care early in the course of treatment for any patient with metastatic cancer or a high symptom burden.<sup>2</sup> In its 2011 guidelines,<sup>3</sup> the Quality Oncology Practice Initiative also emphasized the importance of timely enrollment in hospice for appropriate patients.

Multiple studies have demonstrated the benefits of palliative care, including its ability to decrease patients' symptom burden<sup>4</sup> as well as increase the

likelihood that patients' end-of-life care will align with their preferences<sup>5,6</sup> and, in some specific oncologic cases, even prolong survival.<sup>7</sup> Despite the support for palliative care as a key part of oncologic care, it is often underutilized because of fear of patient response,<sup>8</sup> misunderstanding of the role of palliative care,<sup>9,10</sup> and physicians' uncertainty about the appropriate time to refer patients.<sup>11</sup>

In response to increasing demand for palliative care, attempts have been made to create policy initiatives and referral triage tools<sup>12</sup> to ensure timely access to palliative care referrals and treatment.<sup>13-15</sup>

In designing optimal referral policies, hospitals and clinics need to determine which patients to refer as well as the appropriate timing for these referrals, and to design clinical triggers that can help guide these decisions. As there is no current standard definition of late referral, institutions need to individu-

---

Accepted for publication September 18, 2013. Correspondence: Jessi Humphreys, BS; jhumph@stanford.edu. Disclosures: Dr Harman has been a paid consultant for GRACE, a not-for-profit 501(c)(3) organization for patient education in cancer; KRAMES publications; and SLACK Inc, a publication company. Dr Harman has also received payment for lectures from Stanford Cancer Center, and her institution has received grant support from the Arnold P. Gold Foundation. Ms. Humphreys has received support for travel from the Stanford Medical Scholars Program. JCSO 2014;12:129-136. ©2014 Frontline Medical Communications. DOI 10.12788/jcso.0034.

ally define an inappropriately late referral in order to maximize referrals before that point. This decision requires an understanding of how late referrals to palliative care affect health outcomes.

Additionally, studies of patient preferences demonstrate that although patients overwhelmingly prefer to minimize their in-hospital time and to die at home, they are frequently unable to do so.<sup>16-18</sup> As a result, both in-hospital length of stay and patients' in-hospital mortality are key outcomes to be studied when health policies to improve patient care are designed.

Multiple sources have identified late referrals to palliative care as a pervasive health care issue that requires further research.<sup>19,20</sup> Studies looking at health outcomes of late referrals have found associations with the underdiagnosis of pain as well as worse pain management,<sup>21</sup> lower family satisfaction,<sup>22-24</sup> and increased caregiver burden.<sup>25</sup> Barriers to timely palliative care referrals include oncologic patient and provider perceptions of palliative care as removing hope, a lack of understanding of the services palliative care provides, patient readiness, availability of specialty palliative care services in hospital settings, as well as the language used to refer to palliative and supportive oncologic services.<sup>8,9,26-28</sup> Previous studies have not yet found an association between early palliative care referral and decreased length of hospital stay.<sup>29</sup>

This study was performed utilizing data from Stanford Hospital's palliative care consultation service, which serves 70 to 80 patients monthly at Stanford Hospital, a medium-size (about 440 beds) academic teaching hospital. Most referred patients have a primary diagnosis of cancer (60%), the majority of which are metastatic solid tumors (84%). The palliative care consultation team comprises an attending physician who is board certified in hospice and palliative medicine, an advanced-practice nurse (a nurse practitioner or a clinical nurse specialist), a licensed clinical social worker, and a physician fellow. This consultation service currently depends on referrals from inpatient attending physicians, with no specific clinical triggers to guide the timing of referral to palliative care. As a result, the potential exists for large variability in the length of time that similar patients may wait before being referred. For oncologic patients who receive a palliative care consult, a better understanding of whether the timing of referrals affects patient outcomes can help optimize care and guide hospital policies.

Our primary goal was to determine if a discrepancy exists in health outcomes for patients who are referred early versus late to palliative care, and if so, to determine if a need exists for a policy that encourages physicians to refer to palliative care earlier. Our secondary goal was to better define a late referral to an inpatient palliative care service based on objective health outcomes, including postreferral length of hospital stay and in-hospital mortality.

This study addresses health outcomes associated with late referrals to a palliative care consultation service following inpatient admission. To our knowledge, this is the first study to analyze the relationship between late inpatient palliative care referrals and either the length of hospital stay or in-hospital mortality. Both health outcomes are crucial to take into account in the design of guidelines or policies that improve patient access to palliative care.

## Methods

### Study participants

This retrospective cohort study included patients with pre-existing oncologic diagnoses who received an inpatient palliative care referral and consultation (N = 1,225) since the establishment of Stanford Hospital's palliative care service (July 2007 through May 2011). The data were derived from a medical record database that was populated with input entered into demographic and palliative care fields by a palliative care nurse with every consult.

### Stanford Palliative Care Consultation Service

Referrals are primarily for goals of care (59%), followed by symptom management (18%) and transition to hospice (14%). Although this database did not include data on specific cancers, oncologic patients primarily had solid tumor metastatic disease (84%), followed by bone marrow transplantation (9%) and hematologic malignancy (7%). As a result, the patients were similar in level of disease and disease progression. Although the house staff or other health professionals may suggest referrals, all of these referrals were approved by attending physicians and originated largely from oncologists/hematologists (42%), internists (23%), and intensive care unit (ICU) intensivists (9%). Intensivists who referred patients from the ICU were trained in internal medicine/critical care or in anesthesia/critical care, but not in oncology. Although the percentage of oncologic patients has remained stable throughout the consultation service's history, the number of patients referred has grown considerably (from 30 to 70-80 per month), the average patient age has decreased, and positive experiences with the referring service have produced repeat referring customers among many services and attending physicians, based on indirect measurements including anecdotes and trainee evaluations of the palliative care rotation. Referrals did not include patients scheduled for routine chemotherapy, as these patients are served by a separate nurse practitioner service from which we did not receive referrals.

In a typical palliative care consultation, the advanced practice nurse or physician fellow is paged and speaks to key stakeholder clinicians to triage the referral. Depending on the situation, the initial visit serves as an introduction to palliative care with the goal of further ongoing discussions,

or as an assessment of symptom management needs, or as a strategic family meeting to come to a key decision.

### Statistics

Dichotomous categorical variables were compared with the  $\chi^2$  test, and continuous variables were compared with the 2-sided Student's t-test. Linear regression analysis was used to look at the association between late palliative care referral and both the in-hospital length of stay from consult to discharge and the in-hospital mortality.

Regressions were adjusted for age, sex, ethnicity (white, black, Asian, Hispanic, other), do-not-resuscitate (DNR) status, and number of inpatient admissions in the previous 6 months. These recent inpatient admissions were used to create a binary sickness measure to identify patients who were utilizing inpatient services at high rates (defined as 3 or more admissions in past 6 months), compared with patients using the services at lower rates. Multiple models and studies have used the number of admissions over a defined time period as a proxy for the level of illness, especially in chronic diseases in which admission frequency correlates with decline, such as cancer, asthma, cystic fibrosis, and chronic obstructive pulmonary disease, among others.<sup>30-32</sup>

All data were de-identified before use in statistical modeling software, were maintained on hospital computing systems, and were encrypted according to Stanford University policy. Analysis was performed by the first author, with confirmation of methods by a clinical professor at Stanford who has a PhD in epidemiology. The study protocol was approved by the Stanford University Panel on Medical Human Subjects, IRB #4947. All analyses were performed with STATA statistical software (Statacorp, College Point, Texas; version 11.1).

### Defining late referral to palliative care

The time to referral was defined as the time between the patient's admission to the hospital and the patient's referral to palliative care consultation services. Patients received palliative care consultations within 24 hours of their referral, which made the referral time an effective approximation of the palliative care consultation. In determining the appropriate cutoff for a late versus early referral, we analyzed quartiles of referred patients.

Patients in the first 3 quartiles (that is, those who were referred in the first week following admission [range, 0-7 days]) were similar in health outcomes. However, patients who were referred in the fourth quartile (that is, later than 1 week after admission [range, 8-120 days]) had significantly different outcomes, compared with patients in the first 3 quartiles. Patients were thus analyzed in 2 groups: those referred within the first week (*early*), and those referred later than 1 week (*late*).

## Results

The study sample is described in Table 1. The mean age of all participants was 61.8 years (standard deviation (SD) = 16.5; range, 19-100 years) and 50.1% were female. Groups were similar in terms of DNR status, level of sickness as measured by number of recent inpatient admissions, and demographic variables. Late referrals tended to be younger and were more likely to be white and less likely to be Asian. Patients who were referred late were more likely to be referred from an ICU, and were more likely to expire in the hospital than were those who were referred early. As expected, groups who were referred early and late differed significantly in time to referral, with the mean time to referral for those referred early at 2.5 days (range, 0-7 days) and for those referred late at 21.4 days (range, 8-120 days). Groups also differed on length of stay following referral, with the mean for those referred early at 4.5 days (range, 0-64 days), and for those referred late at 7.4 days (range, 0-61 days).

### Late referrals to palliative care and length of in-hospital stay

The top 5 outliers, which were 7.6 standard deviations (SD) above the mean length of stay following referral (with the next highest at 5.6 SD above the mean), were dropped in response to concerns that they were inaccurately exaggerating the findings and that they represented clinically atypical patients with overly long lengths of stay. Most (3 of the top 5) were bone marrow transplantation patients, who account for a minority of our population (9%) but are known to have protracted hospital stays. Other outliers were patients with complicated stays who transferred in and out of the ICU. Sensitivity analysis revealed that removing these outliers did not alter the statistical significance of the results and served only to underestimate the findings. Those variables that were not entered by our palliative care nurse were identified as missing and were not available in analysis. Table 1 was produced after the outliers were dropped, and includes missing data for transparency.

In-hospital length of stay was defined as the time between the palliative care referral and either the discharge or death of the patient. Previous studies have defined length of stay as the overall length of stay from admission to discharge, but that definition has failed to separate the specific impact that a late referral would have, given that a referral should theoretically affect only the time that follows the referral.<sup>25</sup> In our study, patients who were referred later than 1 week following admission (late referrals) were compared with patients who were referred within 1 week (early referrals) as an independent predictor of in-hospital stay.

As shown in Table 2, waiting longer than 1 week to refer a patient to palliative care, compared with referring a patient within 1 week, was associated with an increase in

**TABLE 1** Patients referred early and late to inpatient palliative care consultation services

Independent predictors <sup>a</sup>	All patients (N = 1,225)	Early referrals <sup>b</sup> (n = 877)	Late referrals <sup>c</sup> (n = 348)	P value <sup>d</sup>
Age, mean (SD), y	61.8 (16.5)	62.8 (16.5)	59.3 (16.1)	< .001
Female, n (SD)	614 (50.1)	452 (51.5)	162 (46.6)	.12
Race, n (%)				
White	640 (52.2)	435 (49.6)	205 (58.9)	< .001
Black	58 (4.7)	46 (5.2)	12 (3.4)	.21
Asian	258 (21.1)	208 (23.7)	50 (14.4)	.001
Hispanic	53 (4.3)	37 (4.2)	16 (4.6)	.69
Other	134 (10.9)	99 (11.3)	35 (10.1)	.64
Missing	82 (6.7)	52 (5.9)	30 (8.6)	
DNR before consult, n (%)	722 (58.9)	531 (60.5)	191 (54.9)	.07
< 3 inpatient admissions in previous 6 mo, n (%)	814 (66.4)	583 (66.5)	231 (66.4)	.89
Missing	4 (0.3)	1 (0.1)	3 (0.9)	
ICU	161 (13.1)	94 (10.7)	67 (19.3)	< .001
Discharge status				
Expired	375 (30.6)	216 (24.6)	159 (45.7)	< .001
Discharged alive	826 (67.4)	649 (74.0)	177 (50.9)	< .001
Missing	24 (2.0)	12 (1.4)	12 (3.4)	
Days between admission and referral, mean (SD; range)	7.9 (12.7)	2.5 (2.0; 0-7)	21.4 (17.3; 8-120)	< .001
Days between referral and discharge, mean (SD; range)	5.3 (7.7)	4.5 (6.3; 0-64)	7.4 (10.3; 0-61)	< .001

DNR, do not resuscitate; ICU, intensive care unit

<sup>a</sup>Results are presented as *n* (%) unless otherwise stated. <sup>b</sup>An early referral is defined as a referral made within the first week after admission. <sup>c</sup>A late referral is defined as a referral made later than 1 week after admission. <sup>d</sup>P value is calculated with  $\chi^2$  for categorical variables and two-sided Student's *t*-tests for continuous variables, with a statistical significance level set at *P* = .05

mean postreferral in-hospital time of 2.70 days. DNR status was also associated with a change in in-hospital time, although it had an inverse relationship to referral timing: Patients who were DNR before their palliative care consult had an average decrease of postreferral in-hospital time of 2.37 days.

Because the patient subgroups – survivors (those who were discharged alive) and decedents (those who expired in the hospital) – were clinically very different populations, they were also analyzed separately.

Changes in the mean length of stay following palliative care referral are shown in the figure. Decedents (*n* = 349) accounted for 31% of patients, and survivors (*n* = 766) were 69% of patients. In contrast to previous studies that have found a disappearance of effect when these 2 groups were separated,<sup>25</sup> the effect was enhanced by the removal of decedents. When we looked only at survivors, waiting a week to be referred to palliative care was associated with an increase in the postreferral length of stay of 3.40 days, up from 2.70 when we considered the entire population. For decedents, waiting a week to be referred for palliative care, as opposed to being referred within 1 week, was associated with an increase

in the postreferral length of stay of 0.87 days. This suggests not only that these findings apply to survivors, but that survivors are driving the association of late referral with increased length of stay.

Decedents and survivors also differed in their association of DNR code status with postreferral length of stay. For decedents, DNR status before consult was associated with a larger decrease in length of stay (decrease, 3.97 days), compared with the decrease for survivors (decrease, 1.41 days).

#### Late referrals to palliative care and in-hospital mortality

The second health outcome studied was in-hospital mortality, defined as a patient's likelihood to expire in the hospital as opposed to being discharged alive to another location. As shown in Table 3, we found a significant odds ratio for the outcome of interest. Being referred later than 1 week was associated with an adjusted odds ratio (AOR) of dying in the hospital that was 3.04 times higher than the odds of being discharged alive (95% confidence interval, 2.28-4.05). DNR status was also associated with a higher risk of in-hospital mortality (AOR, 2.09; 95% CI, 1.57-2.78).

## Discussion

In this study of the timing of referrals to an inpatient palliative care consultation service, late referrals were found to be significantly correlated with worse hospital courses. Patients who were referred later than 1 week after admission were more likely to stay in the hospital for longer periods of time following their referral, and they had higher rates of in-hospital mortality.

As inpatient palliative care consultation services become more prevalent, hospitals will face decisions surrounding how these services can best improve the quality of patient care. Patient satisfaction is a key quality outcome when the success of palliative care services is studied. Studies of patient preferences demonstrate that patients are frequently unable to minimize their in-hospital time in order to die at home, despite their desire to do so.<sup>16-18</sup> As a result, both in-hospital length of stay and in-hospital mortality are crucial outcomes to consider in the design of health policies to improve patient care.

Although multiple organizations<sup>1-3</sup> have published guidelines encouraging early referral to palliative care and hospice, a “late referral” has received a wide array of definitions. Multiple studies have defined a “late referral” to hospice care in relation to patients’ decreased survival times following hospice referral.<sup>19,20</sup> For an inpatient palliative care consultation service, it is challenging to apply these somewhat fluid definitions to guide the timing of a primary team’s referral to inpatient palliative care.

In the attempt to improve access to inpatient palliative care services, a key intervention point is the time point at which the primary team consults the palliative care service. In an ideal situation, each patient in need of palliative care would be referred at the appropriate time and would expect comparable health outcomes after that point. In our study, the discrepancy in health outcomes between patients referred early versus late suggests that a late referral might affect the patient’s post-referral length of stay and in-hospital mortality, independent of demographics, illness, or DNR status. These data support the design of policies that encourage earlier referrals to palliative care and assist primary care teams in deciding when to refer.

Our model suggests that there may be a mechanism by which a late referral causes or increases the chance of poor outcomes. Although this mechanism is unknown, several clinical interpretations exist, including the possibility that patients who are referred late have been started on further appropriate (or

**TABLE 2** Late palliative care consultation referral and in-hospital time from consultation to discharge

Independent predictors (n = 1,139)	Change in mean no. in-hospital days (95% CI) <sup>a</sup>	P value
Referred late to palliative care <sup>b</sup>	2.70 (1.74, 3.67)	< .001 <sup>c</sup>
Age	-0.05 (-0.08, -0.02)	< .001 <sup>c</sup>
Female	-0.16 (-1.01, 0.70)	.72
Race <sup>d</sup>		
Black	0.55 (-1.44, 2.53)	.59
Asian	0.04 (-1.03, 1.11)	.94
Hispanic	2.27 (0.20, 4.34)	.03 <sup>e</sup>
Other	1.27 (-0.10, 2.65)	.07
DNR prior to consult	-2.37 (-3.26, -1.48)	< .001 <sup>c</sup>
< 3 inpatient admissions in previous 6 mo	0.42 (-0.49, 1.33)	.37

CI, confidence interval; DNR, do not resuscitate

<sup>a</sup>Values from a linear regression, controlling for baseline characteristics. <sup>b</sup>Late referral denotes referral later than 1 week following admission. <sup>c</sup>P value is significant at < .001. <sup>d</sup>Odds ratios are in relation to a baseline. In this case, white patients comprised the largest population so they were used as the baseline. <sup>e</sup>P value is significant at < .05.

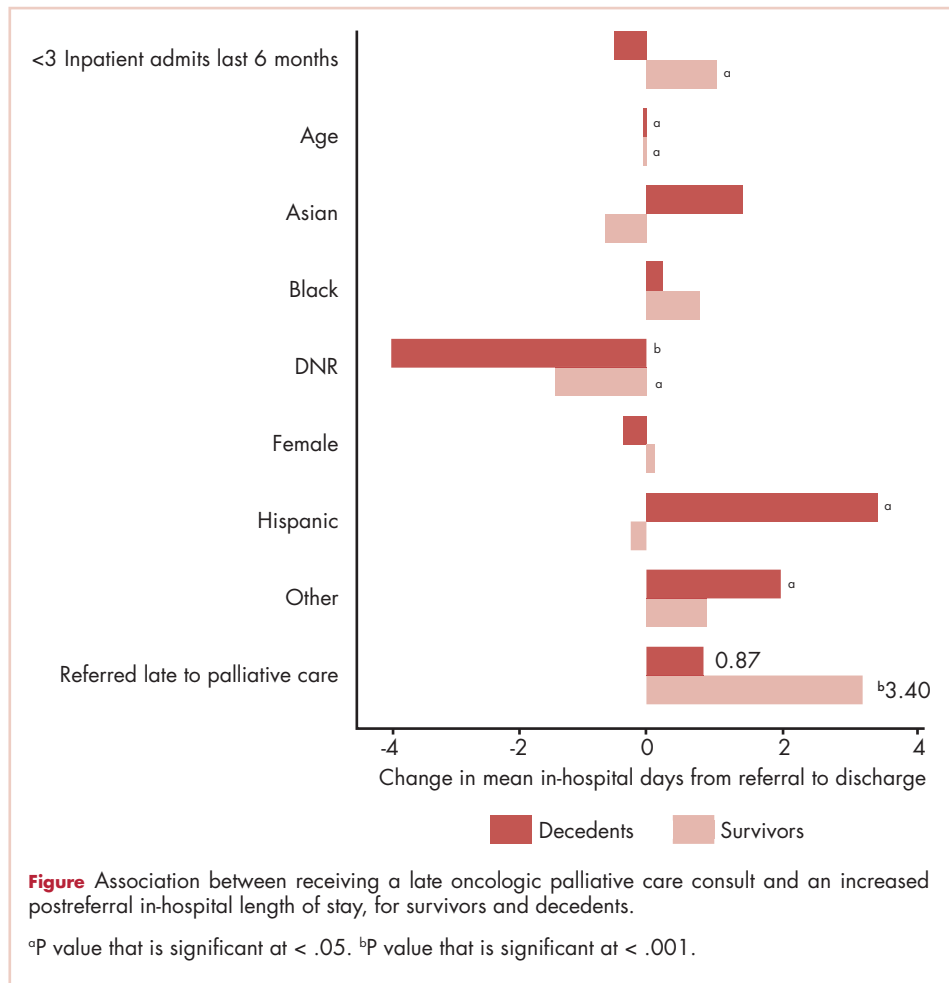
inappropriate) time-consuming medical diagnostics and treatment that extend their length of stay longer than that of those patients who were referred early to palliative care. Those patients who were referred later may also have deteriorated clinically during their prolonged hospital stay, to the point where they cannot safely or comfortably transition to an outpatient setting and thus miss the opportunity for timely end-of-life planning. In future studies, we hope to explore other factors that are potentially involved in this mechanism, including cancer site, type and complexity of consultation (symptom management or decision making), the patient’s capacity,

**TABLE 3** Late palliative care consultation and in-hospital mortality

Independent predictors (n = 1,115)	Adjusted odds ratio (95% CI) <sup>a</sup>	P value
Referred late to palliative care <sup>b</sup>	3.04 (2.28, 4.05) <sup>c</sup>	≤ .001 <sup>d</sup>
Age	0.99 (0.98-1.00)	.02 <sup>d</sup>
Female	0.72 (0.55-0.93)	.01 <sup>d</sup>
Race <sup>e</sup>		
Black	0.99 (0.52-1.92)	.99
Asian	1.05 (0.75-1.47)	.77
Hispanic	0.99 (0.52-1.90)	.99
Other	1.12 (0.73-1.72)	.59
DNR prior to referral	2.09 (1.57-2.78)	< .001 <sup>f</sup>
< 3 inpatient admissions in previous 6 months	1.01 (0.76-1.34)	.97

CI, confidence interval; DNR, do not resuscitate; OR, odds ratio

<sup>a</sup>Odds ratio is from a logistic regression, controlled for baseline characteristics. <sup>b</sup>Late referral denotes referral later than 1 week following admission. <sup>c</sup>Unadjusted OR, 2.70 (2.07, 3.51). <sup>d</sup>P value is significant at < .05. <sup>e</sup>Odds ratios are in relation to a baseline. In this case, white patients comprised the largest population so they were used as the baseline. <sup>f</sup>P value is significant at < .001.



found that a late referral for survivors was associated with a larger increase in the length of stay (3.04 days), compared with the increased length of stay for decedents (0.87 days). This key result has not been found in previous studies, and here suggests a separate mechanism (other than early in-hospital death) that is driving the association of late referral with increased length of stay. The fact that our findings are enhanced by separating out survivors supports the need for early referrals for all palliative care patients, including those who are expected to be discharged alive and who are at different stages of palliative and end-of-life discussions.

Our study has multiple strengths that are worth noting. In studying oncologic patients with varied oncologic diagnoses who were referred to inpatient consultation services at our hospital, our results are generalizable to a variety of inpatient oncologic diagnoses with varied palliative care needs. In addition, because we isolated the time before referral (defined as from admission to referral) from the time following referral (defined as from referral to discharge), we were able to identify the separate association of late referral with the postreferral length of stay. Previous studies have utilized overall length of

and the patient's previous experience with end-of-life or palliative care.

Of particular interest is the association of DNR status with both increased in-hospital mortality and decreased length of stay. Clinical interpretation of our data suggests that patients who had previously expressed interest in limiting care might have less interest in other life-prolonging interventions while they received a palliative care consult, resulting in an earlier demise or earlier discharge.

An important question in our study was whether the association of referral timing with length of stay was driven by increased in-hospital mortality. To address this, we looked separately at the subgroup of patients who were discharged alive from the hospital. When length of stay is utilized as a health outcome, it is important to separate survivors from those who expired in the hospital, because decreasing the length of in-hospital time for decedents necessarily means a decreased length of life. Previous studies failed to separate these groups, or found that trends in length of stay were driven by patients who died in the hospital and thus were not generalized to all patients who receive palliative care consultation.<sup>29</sup> When we analyzed decedents and survivors separately, we

stay as an observed outcome to determine the impact of palliative care referral, but doing so fails to recognize that time to referral is a confounding factor for overall length of stay.<sup>29</sup> Our study addressed the association of these two distinct time periods, and thus better answered the question of how referral timing is independently associated with the length of stay following that referral.

The study limitations should be noted:

- This was a retrospective study utilizing regression analyses to demonstrate the association of late referral with poor health outcomes, so causality cannot be inferred.
- Because no formal outpatient palliative care services were available during this study, these results are specific to inpatient consultation services in a single academic center with a well-established palliative care referral program that was associated with a cancer center.
- Although patients largely had diagnoses of metastatic solid tumors, the individual patient oncologic diagnoses were not available in our data, and thus we were unable to determine if specific diagnoses and/or stages of disease drove some of the association with decedent or survivor status, resulting in a type I error source.

- Although we utilized the number of recent inpatient admissions as a proxy for patient sickness burden, which is a technique supported by previous studies,<sup>30-32</sup> another measure of illness and prognosis could have strengthened the findings.
- Lastly, although we controlled for possible confounders in our model, including DNR status and sickness level, type I errors could result from our inability to control for variables that were not available in our data, including the complexity of referral or end-of-life needs, patient education/receptivity, and the influence of the provider/referring service.

Despite these limitations, this study presents strong data concerning the need for palliative care to be incorporated into the care of hospitalized oncology patients earlier rather than later.

Next steps include further assessing why certain patients are more likely to be referred late to palliative care than are others. This study shows preliminary differences in patient race, with late referrals more likely to be white and less likely to be Asian, compared with early referrals. Future studies are needed to identify what health disparities exist in access to palliative care for inpatient oncologic services. Further studies are also indicated to identify if there are certain services that are referring later than others.

Our study suggests that late referrals are more likely to originate from the ICU, possibly because clinicians on that unit have varying levels of awareness of the guidelines regarding appropriate early referral to palliative care; however, our study does not address whether these referrals are indicated or appropriate in some situations. We would expect patients who are referred from the ICU to have longer lengths of stay because of the increased time required to transfer from the ICU and stabilize on the medical floor. Patients with more aggressive goals of care who are interested in advancing their care to ICU status may also have a higher likelihood of choosing interventions that prolong their stay in the hospital. In future studies, we hope to better analyze the relationship of ICU palliative care referrals and resulting patient outcomes. A policy change that focuses first on the patients who have the highest palliative need and are referred by services that care for the most at-risk patients, has a capacity to show more immediate and measurable change early in its implementation.

Many hospitals have adopted screening tools or triggers in order to optimize access to inpatient palliative care. In addition, many have focused on ICU populations; have utilized level of illness, neurological status, and family readiness/dynamics; and have tailored triggers to individual centers and patient populations.<sup>33-35</sup> We support these attempts to further assess which triggers – whether they are based on timing, diagnosis, or symptoms – are best poised to capture patients in need of palliation.

Moving forward, improved data collection with a focus

on patient disease and symptomatology, as well as referral type and timing, will be crucial to optimize referral timing and to develop clinical triggers specific to individual patient populations and health centers. Because it is rare for primary services to track their own use of palliative care or elements of end-of-life care (such as advance directive use), the responsibility for data collection may fall to palliative care services. Current barriers to data collection include the availability of financial and human resources.

Our findings argue strongly for improved education that emphasizes the importance of referring early to palliative care in an inpatient setting for both physicians and supporting health care professionals, with a focus on referring in the first week following admission for our population. To assist the primary care team in the decision to refer, this study also supports the development of policies that utilize triggers to refer select patients to palliative care. These efforts would entail gaining a better understanding of how to identify patients who would benefit from a palliative care referral. Such policies would necessitate creating a reliable process of screening patients for palliative care needs. If this were accomplished, our hope is that patients in need of palliative care would have earlier access and improved health outcomes, as measured by decreased in-hospital mortality and length of stay. Because palliative care is increasingly at the forefront of health policy discussions, these findings play a critical role in ongoing discussions about improved access to palliative care. These data are also important in the context of continuous adherence to patient quality measures. As studies continue to find that patients prefer to minimize their in-hospital time and to die at home instead of in hospitals,<sup>16-18</sup> interventions that improve these outcomes will increasingly deserve attention when health policies are designed.

#### Acknowledgements

Rita Popat, PhD, provided statistical assistance. Corinna Haberland, MD, and Preetha Basaviah, MD, contributed to editing.

#### References

1. Clinical practice guidelines for quality palliative care. 2nd Ed. Pittsburgh, PA: National Consensus Project for Quality Palliative Care; 2009.
2. Smith TJ, Temin S, Alesi ER, et al. American Society of Clinical Oncology provisional clinical opinion: the integration of palliative care into standard oncology care. *J Clin Oncol.* 2012;30:880-887.
3. The Quality Oncology Practice Initiative. Summary of Measures, Fall, 2011. American Society of Clinical Oncology; 2011. <http://qopi.asco.org/Documents/QOPIFall2011MeasuresSummary.pdf>. Accessed July 15, 2012.
4. Hearn J, Higginson IJ. Do specialist palliative care teams improve outcomes for cancer patients? A systematic literature review. *Palliat Med.* 1998;12:317-332.
5. Bell CL, Somogyi-Zalud E, Masaki KH. Methodological review: measured and reported congruence between preferred and actual place of death. *Palliat Med.* 2009;23:482-490.
6. Wright AA, Keating NL, Balboni TA, Matulonis UA, Block SD, Prigerson HG. Place of death: correlations with quality of life of patients with cancer and predictors of bereaved caregivers' mental health. *J Clin Oncol.* 2010;28:4457-4464.

7. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med*. 2010;363:733-742.
8. Smith CB, Nelson JE, Berman AR, et al. Lung cancer physicians' referral practices for palliative care consultation. *Ann Oncol*. 2012;23:382-387.
9. Johnson C, Paul C, Girgis A, Adams J, Currow DC. Australian general practitioners' and oncology specialists' perceptions of barriers and facilitators of access to specialist palliative care services. *J Palliat Med*. 2011;14:429-435.
10. Knapp C, Thompson L, Madden V, Shenkman E. Paediatricians' perceptions on referrals to paediatric palliative care. *Palliat Med*. 2009;23:418-424.
11. Wirth A, Smith JG, Ball DL, et al. Symptom duration and delay in referral for palliative radiotherapy in cancer patients: a pilot study. *Med J Aust*. 1998;169:32-36.
12. Philip JA, Le BH, Whittall D, Kearney J. The development and evaluation of an inpatient palliative care admission triage tool. *J Palliat Med*. 2010;13:965-972.
13. de Sa E, Sinclair E, Mitera G, et al. Continued success of the rapid response radiotherapy program: a review of 2004-2008. *Support Care Cancer*. 2009;17:757-762.
14. Danjoux C, Chow E, Drossos A, et al. An innovative rapid response radiotherapy program to reduce waiting time for palliative radiotherapy. *Support Care Cancer*. 2006;14:38-43.
15. Cheng WW, Willey J, Palmer JL, Zhang T, Bruera E. Interval between palliative care referral and death among patients treated at a comprehensive cancer center. *J Palliat Med*. 2005;8:1025-1032.
16. Townsend J, Frank AO, Fermont D, et al. Terminal cancer care and patients' preference for place of death: a prospective study. *BMJ*. 1990;301:415-417.
17. Fukui S, Fujita J, Tsujimura M, Sumikawa Y, Hayashi Y, Fukui N. Late referrals to home palliative care service affecting death at home in advanced cancer patients in Japan: a nationwide survey. *Ann Oncol*. 2011;22:2113-2120.
18. Costantini M, Camoirano E, Madeddu L, Bruzzi P, Verganelli E, Henriquet F. Palliative home care and place of death among cancer patients: a population-based study. *Palliat Med*. 1993;7:323-331.
19. Costantini M, Toscani F, Gallucci M, et al. Terminal cancer patients and timing of referral to palliative care: a multicenter prospective cohort study. Italian Cooperative Research Group on Palliative Medicine. *J Pain Symptom Manage*. 1999;18:243-252.
20. Osta BE, Palmer JL, Paraskevopoulos T, et al. Interval between first palliative care consult and death in patients diagnosed with advanced cancer at a comprehensive cancer center. *J Palliat Med*. 2008;11:51-57.
21. Akashi M, Yano E, Aruga E. Under-diagnosis of pain by primary physicians and late referral to a palliative care team. *BMC Palliat Care*. 2012;11:7. <http://www.biomedcentral.com/1472-684X/11/7>. Accessed December 1, 2012.
22. Morita T, Akechi T, Ikenaga M, et al. Late referrals to specialized palliative care service in Japan. *J Clin Oncol*. 2005;23(12):2637-2644.
23. Morita T, Miyashita M, Tsuneto S, Sato K, Shima Y. Late referrals to palliative care units in Japan: nationwide follow-up survey and effects of palliative care team involvement after the Cancer Control Act. *J Pain Symptom Manage*. 2009;38:191-196.
24. Teno JM, Shu JE, Casarett D, Spence C, Rhodes R, Connor S. Timing of referral to hospice and quality of care: length of stay and bereaved family members' perceptions of the timing of hospice referral. *J Pain Symptom Manage*. 2007;34:120-125.
25. Higginson IJ, Costantini M, Silber E, Burman R, Edmonds P. Evaluation of a new model of short-term palliative care for people severely affected with multiple sclerosis: a randomised fast-track trial to test timing of referral and how long the effect is maintained. *Postgrad Med J*. 2011;87:769-775.
26. Dalal S, Palla S, Hui D, et al. Association between a name change from palliative to supportive care and the timing of patient referrals at a comprehensive cancer center. *Oncologist*. 2011;16:105-111.
27. Wentlandt K, Krzyzanowska MK, Swami N, Rodin GM, Le LW, Zimmermann C. Referral practices of oncologists to specialized palliative care. *J Clin Oncol*. 2012;30:4380-4386.
28. Kumar P, Casarett D, Corcoran A, et al. Utilization of supportive and palliative care services among oncology outpatients at one academic cancer center: determinants of use and barriers to access. *J Palliat Med*. 2012;15:923-930.
29. Cassel JB, Kerr K, Pantilat S, Smith TJ. Palliative care consultation and hospital length of stay. *J Palliat Med*. 2010;13:761-767.
30. Andersson FL, Svensson K, Gerhardsson de Verdier M. Hospital use for COPD patients during the last few years of their life. *Respir Med*. 2006;100:1436-1441.
31. Rosenwax LK, McNamara BA, Murray K, McCabe RJ, Aoun SM, Currow DC. Hospital and emergency department use in the last year of life: a baseline for future modifications to end-of-life care. *Med J Aust*. 2011;194:570-573.
32. Donzé J, Aujesky D, Williams D, Schnipper JL. Potentially avoidable 30-day hospital readmissions in medical patients: derivation and validation of a prediction model. *JAMA Intern Med*. 2013;173:632-638.
33. Trout A, Kirsh KL, Peppin JF. Development and implementation of a palliative care consultation tool. *Palliat Support Care*. 2012;10:171-175.
34. Nelson JE, Curtis JR, Mulkerin C, et al; for Improving Palliative Care in the ICU (IPAL-ICU) Project Advisory Board. Choosing and using screening criteria for palliative care consultation in the ICU: a report from the Improving Palliative Care in the ICU (IPAL-ICU) Advisory Board. *Crit Care Med*. 2013;41:2318-2327.
35. Weissman DE, Meier DE. Identifying patients in need of a palliative care assessment in the hospital setting: a consensus report from the Center to Advance Palliative Care. *J Palliat Med*. 2011;14:17-23.