

# Rehospitalization of Older Adults Discharged to Home Hospice Care

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## Abstract

**Background:** Acute hospital readmission of older adults receiving hospice care is not aligned with hospice goals.

**Objective:** To identify factors associated with 30-day readmission among older adults newly discharged to hospice.

**Design/Subjects:** Medical record review of 59 patients, 19 readmitted within 30 days and 40 randomly selected controls not readmitted, from 206 patients newly discharged to home hospice care between February 1, 2005 and January 31, 2010.

**Measures/Analysis:** Information was collected about hospital course, end-of-life planning, and post-hospitalization follow-up. We calculated bivariate associations and developed a Cox Proportional Hazards model examining the relation between index admission characteristics and readmission.

**Results:** Patients' mean age was  $79.7 \pm 8.4$ ; 74.6% were female; 52.5% were black. Among those readmitted, 25% had received a palliative care consultation, compared to 47.1% of those not readmitted ( $p = 0.06$ ). Patients without a participating decision-maker involved in their hospice decision had 3.5 times the risk of readmission within 30 days, compared to those with (hazard ratio [HR] 3.53, confidence interval [CI] 0.97, 12.82). Patients who had one or more telephone contacts with their primary care physician (PCP) during week 1 after discharge had 2.4 times the readmission risk within 30 days, compared to patients with no such contacts during this period (HR 2.35, CI 0.9, 6.1).

**Conclusions:** Readmission within 30 days of initial discharge to hospice is associated with several measures of care and care planning. Further study of these measures may identify opportunities for interventions to improve the hospital-to-hospice transition and to decrease hospital readmissions.

## Introduction

HOSPICE CARE provides physical and emotional support to patients at the end of life. Patients who choose hospice care decide to forego curative treatment; as such, acute readmission to hospitals is usually not aligned with hospice goals.<sup>1,2</sup> Although almost 20% of older adults are readmitted within 30 days of discharge,<sup>3</sup> little is known about readmission of patients newly discharged to hospice and the factors associated with it. In this pilot study, we sought to identify some of these factors, basing our hypotheses on existing data about readmissions of patients near the end of life. For example, in one study, patients with cancer receiving hospice care who subsequently disenrolled were more likely

to be hospitalized (39.8% versus 1.6%).<sup>4</sup> In another study, receipt of hospice (4.6%) or in-home palliative care (8.3%) was associated with reduced readmission in seriously ill adults.<sup>5</sup> By comparing characteristics of patients who were readmitted from hospice to a random sample of patients who were not, we identified factors associated with 30-day hospital readmission among patients discharged to home hospice care.

## Methods

### Study population

Subjects were drawn from a larger study of 30-day readmissions that included patients 65 years or older with primary

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care physicians (PCPs), excluding hemodialysis patients and scheduled readmissions, who were discharged from inpatient medical services between February 1, 2005 and January 31, 2010 at an urban academic medical center.<sup>6</sup> Of these, 206 were discharged to home hospice. The first admission from which the patient was discharged to hospice was considered the index admission. Nineteen of the 206 patients were readmitted within 30 days. To maximize study efficiency, comparison patients who were not readmitted were randomly selected from the remaining 187 (2:1 ratio;  $n=40$ ). They did not differ on demographics or year of discharge from those not selected. The study was approved by the Boston University Medical Campus Institutional Review Board.

#### Data collection and measures

From administrative data we collected age, gender, race, language, insurance type, and admission length. We developed an abstract form to collect information not available from administrative data and developed decision rules for prioritizing data sources. From the index admission medical record, we collected religious affiliation, admission and hospice diagnoses, comorbidities, palliative care consultations, intensive care unit (ICU) care, and participating decision-maker involvement, either with or on behalf of the patient (i.e., spouse, child, friend, guardian). We also determined whether a Massachusetts Comfort Care/Do Not Re-

suscitate (CC/DNR) form had been completed. These forms are to be posted in the patient's home for emergency response personnel, although we were unable to confirm the actual posting. All data were collected by a trained abstractor (A.G.) with 100% review by an experienced geriatrician (R.A.S.).

For patients rehospitalized within 30 days, similar data were collected at readmission, including admission and discharge diagnoses, changes in directives and treatment plans, and discharge destination.<sup>7-9</sup> For these patients, we collected from the outpatient medical record the number of PCP telephone contacts over the first 7 days following discharge. We ascertained time from index hospitalization until death from the Social Security Death Index (SSDI). The primary outcome was 30-day hospital readmission.

#### Statistical Analysis

Bivariate associations between index admission characteristics and readmission within 30 days were obtained and described with percentages, means and standard deviations, and medians and interquartile ranges, as appropriate. The statistical strength of the bivariate associations was tested using  $\chi^2$  or Fisher's exact tests for categorical characteristics, and Wilcoxon's rank sum test for continuous or count characteristics. Characteristics with a bivariate  $p$  value  $< 0.10$  were entered stepwise into a Cox proportional hazards model; variables were excluded and retained when  $p > 0.15$  or  $< 0.15$ ,

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF PATIENTS DISCHARGED TO HOSPICE

Patients	Total 59	Cases (readmission) 19	Controls (no readmission) 40	p value
Age				0.09
Mean age (SD)	79.7 (8.4)	77.1 (8.0)	81.0 (8.3)	
Median age (IQR)	79.0 (73.0, 86.0)	75.0 (71.0, 83.0)	79.0 (75.0, 87.0)	
Gender: $n$ (%)				1.00
Male	15 (25.4)	5 (26.3)	10 (25.0)	
Female	44 (74.6)	14 (73.7)	30 (75.0)	
Race: $n$ (%)				0.11
White	21 (35.6)	5 (26.3)	16 (40.0)	
Black/African American	31 (52.5)	9 (47.4)	22 (55.0)	
Hispanic/Latino	4 (6.8)	3 (15.8)	1 (2.5)	
Other	3 (5.1)	2 (10.5)	1 (2.5)	
Language: $n$ (%)				0.63
English	45 (76.3)	14 (73.7)	31 (77.5)	
Spanish	3 (5.1)	2 (10.5)	1 (2.5)	
Creole	5 (8.5)	1 (5.3)	4 (10.0)	
Other	6 (10.2)	2 (10.5)	4 (10.0)	
Religion: $n$ (%)				1.00
Catholic	24 (40.7)	8 (42.1)	16 (40.0)	
Protestant	26 (44.1)	9 (47.4)	17 (42.5)	
Jewish	3 (5.1)	1 (5.3)	2 (5.0)	
Muslim	4 (6.8)	1 (5.3)	3 (7.5)	
None	1 (1.7)	0 (0.0)	1 (2.5)	
Other	1 (1.7)	0 (0.0)	1 (2.5)	
Insurance: $n$ (%)				1.00
Medicare (alone, Advantage, or with secondary commercial insurance)	14 (23.7)	4 (21.1)	10 (25.0)	
Dual Eligibles (Medicare + Medicaid)	45 (76.3)	15 (78.9)	30 (75.0)	

SD, standard deviation; IQR, interquartile range.

respectively. Hazard ratios and 95% confidence intervals from the Cox proportional hazards model described associations with readmission within 30 days. For patients who were not readmitted and died within 30 days of the index admission, follow-up time ended at the SSDI date of death. If not identified in the SSDI, patients were assumed to be alive for the 30 days postindex discharge and follow-up ended at 30 days.

**Results**

Table 1 displays the demographic and clinical characteristics of patients discharged to hospice from the inpatient medical service. The majority of patients were women, black, and English-speaking. The patients' religious affiliations were evenly divided between Catholic and Protestant. They received primarily Medicaid, in addition to the Hospice Medicare Benefit. Table 2 displays the clinical characteristics of subjects, including a comparison of those readmitted and those not. The most prevalent hospice diagnosis in both groups was cancer. Other diagnoses included congestive heart failure, chronic obstructive pulmonary disease, and dementia. Readmitted patients were less likely to have received a palliative care consultation during the initial hospitalization and were less likely to have a participating decision-maker than those who were not readmitted, although neither association was statistically significant.

The median time between index discharge and readmission was eight days. Readmitted patients had a higher rate of telephone calls per day to their PCPs than patients not readmitted (0.4 versus 0.1). Of the 19 patients readmitted, 26.4% were admitted to the ICU. The Cox Proportional Hazards model (Table 3) demonstrated that older patients; patients with participating decision-makers; and patients who

had no PCP telephone contacts during the week following discharge were less likely to be readmitted. Having a palliative care consult and a cancer diagnosis were entered into the stepwise Cox proportional hazards model but did not reach the significance level to be retained.

**Discussion**

Patients discharged to hospice and readmitted within 30 days were less likely to have palliative care consultations or participating decision-makers; they were more likely to have had telephone contact with their PCP between admissions. As the goals of palliative and hospice care are generally well-aligned, we were not surprised that patients not readmitted were more likely to have had a palliative care consultation. Palliative care teams achieve better outcomes for patients at the end of life, including improved symptom management and fewer readmissions.<sup>10</sup> Communication about the expected trajectory of decline improves patients and families' understanding of terminal disease and reduces the propensity for patients' hospital return. In addition, participants in the decision-making process better appreciate their loved ones' wishes.<sup>11</sup> An additional decision-maker, particularly if it is a loved one, may reduce the patient's anxiety about hospice. Furthermore, as many decision-makers are also the patients' primary caregivers, including them may alleviate some of their own anxieties about meeting their loved ones' needs. Thus patients and families may find symptoms and exacerbations more manageable at home when they have chosen hospice together.

We found that patients who had telephone contact with their PCPs with greater frequency after discharge were more likely to be readmitted, causing us to wonder about PCP involvement, if at all, in the decision-making process.

TABLE 2. CLINICAL CHARACTERISTICS OF PATIENTS DISCHARGED TO HOSPICE

<i>Patients</i>	<i>Total 59</i>	<i>Cases (rehospitalization) 19</i>	<i>Controls (no rehospitalization) 40</i>	<i>p value</i>
Hospice diagnosis: <i>n (%)</i>				0.22
Cancer	35 (59.3)	12 (63.2)	23 (57.5)	
CHF	5 (8.5)	2 (10.5)	3 (7.5)	
COPD	2 (3.4)	2 (10.5)	0 (0.0)	
Dementia	12 (20.3)	2 (10.5)	10 (25.0)	
Other	5 (8.5)	1 (5.3)	4 (10.0)	
Length of index admission				0.27
Mean (SD)	8.4 (6.6)	7.8 (7.4)	8.7 (6.2)	
Median (IQR)	6.0 (4.0, 11.0)	5.0 (2.0, 9.0)	7.0 (4.0, 12.0)	
Palliative care consultation: <i>n (%)</i>				0.06
Yes	22 (37.3)	4 (21.1)	18 (45.0)	
No	37 (62.7)	15 (78.9)	22 (55.0)	
Participating decision-maker involved in hospice decision: <i>n (%)</i>				0.09
Yes	55 (93.2)	16 (84.2)	39 (97.5)	
No	4 (6.8)	3 (15.8)	1 (2.5)	
Signed Massachusetts Comfort Care Form: <i>n (%)</i>				0.53
Yes	25 (42.4)	7 (36.8)	18 (45.0)	
No	22 (37.3)	9 (47.4)	13 (32.5)	
Missing	12 (20.3)	3 (15.8)	9 (22.5)	

CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; SD, standard deviation; IQR, interquartile range.

TABLE 3. STEPWISE COX PROPORTIONAL HAZARDS MODEL FOR READMISSION

<i>Variable</i>	<i>Hazard ratio (95% confidence interval)</i>
Age at index discharge (5-year increase)	0.77 (0.58, 1.03)
Participating decision-maker involved in hospice decision	
Yes (referent)	1.0 (—)
No	3.53 (0.97, 12.82)
Number of phone contacts during first week after index discharge	
None (referent)	1.0 (—)
1 or more	2.35 (0.9, 6.1)

Clinical complexity, patient/caregiver anxiety, and complicated care transitions may all increase the frequency with which patients rely on PCPs for support after discharge<sup>13</sup> and, subsequently, may also increase the likelihood of readmission. Further investigation of the content of the telephone calls could help elucidate the nature of these interactions, particularly since there is mixed evidence regarding the value of PCP interactions in reducing hospital readmission.<sup>9,14</sup> PCPs may or may not be aware of or agree with the goals of the hospice care team.

We were surprised that, of readmitted patients, more than one-quarter were admitted to the ICU. This appears inconsistent with the decision to forego life-prolonging treatment. However, it may reflect patient and/or family ambivalence with choosing hospice. Alternatively, it may reflect challenges of managing unrelated conditions that adversely affect quality of life (e.g., urinary tract infections) in the context of hospice care.

In spite of the comprehensiveness of our data collection, our study has several limitations. First, we studied only 19 cases and 40 comparison patients, limiting statistical power and overall generalizability. Second, the retrospective observational study design does not allow determination of causality. Third, because we did not have access to hospice records, our data were limited to inpatient and outpatient medical records. Finally, the study population was restricted to patients 65 years and older who were discharged home with hospice and did not include discharges to inpatient hospice facilities.

Nonetheless, our study begins to elucidate factors associated with the rehospitalization of hospice patients and highlights potential improvements to the transition to hospice care. Future studies should examine more closely the hospice referral process. Improved understanding of communication during the transition from hospital to home hospice is needed, through investigation of patients', clinicians', and caregivers' understanding of palliative and hospice care and perspectives on readmission reasons. Future studies should also address the very important question of readmission preventability.

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#### Author Disclosure Statement

No competing financial interests exist.

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