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Homecare Referrals and 12-Week Outcomes Following Surgery for Cancer

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Abstract

Purpose/Objectives—To determine characteristics of patients undergoing cancer surgery who do and do not receive homecare referral after hospitalization, relative to poor discharge outcomes.

Design—Secondary analysis of a randomized clinical trial.

Setting—Urban, academic cancer center in the northeastern United States.

Sample—375 patients 60 years and older and admitted for solid tumor cancer surgery.

Methods—Stepwise, multiple logistic regression using patient characteristics related to homecare referrals or those related to poor discharge outcomes.

Main Research Variables—Homecare referral and poor discharge outcome.

Findings—Patients 70 years or older, single, hospitalized for a week or more for a late-stage cancer, with greater than four comorbid conditions, and discharged with more than four daily activity impairments, depressive symptoms, and a need for skilled nursing care were more likely to require home care. Patients not referred to home care who received adjuvant cancer therapies were about three times more likely to have poor discharge outcomes.

Conclusions—Patients who were referred for home care had characteristics similar to medical or surgical patients documented in the literature. However, younger patients with lengthy hospital stays and recipients of adjuvant cancer therapy did poorly after discharge and may benefit from home care.

Implications for Nursing—Certain characteristics, such as age, single marital status, depression, and cognition, should trigger further assessment of patients' needs after discharge, including anticipating needs of patients who will receive adjuvant therapies.

Agrowing body of knowledge is making it easier to identify the characteristics of hospitalized adults who need home care, the likelihood of homecare referral, and poor discharge outcomes; however, no evidence-based guidelines exist to assist clinicians in determining who needs a homecare referral. Medicare regulations state patients must have a need for skilled assistance

and be homebound (Centers for Medicare & Medicaid Services [CMS], 2007) but, beyond these criteria, the decision is left up to individual clinicians' nonstandardized data collection and judgment (Kramer, 2006).

Correctly identifying patients in need of post-acute care services (home care, inpatient rehabilitation, skilled nursing facility, nursing home) is critical because when patients are discharged with unmet needs and not referred for post-acute care services, poor outcomes, including psychological and symptom distress, unmet goals, complications, emergency department visits, and costly readmissions to the hospital, often occur (Bowles et al., 2008; Dennis, Blue, Stahl, Bengel, & Shaw, 1996; Morasso et al., 1999; Naylor et al., 1994, 1999, 2004; Potthoff, Kane, & Franco, 1997; Prescott, Soeken, & Griggs, 1995). Yost (1995) reported that 41% of patients with cancer had complex issues requiring home care but did not receive services. Sixty percent of the group were not offered the services and 40% were offered home care but refused to accept it.

Determining the characteristics of hospitalized patients with cancer who need home care has always been a challenge, but the current acute care environment—with shortened hospital stays, inconsistent assessment criteria, varying levels of clinician expertise, and lack of time for decision making—results in the discharge of vulnerable patients without plans for follow-up care (Bowles, Foust, & Naylor, 2003; Bowles, Naylor, & Foust, 2002; Potthoff et al., 1997). Studies have shown value in providing home care for patients with cancer. McCorkle et al. (1994) found that patients who received home care ($n = 49$) had significantly improved mental health, symptom distress, function, and health perceptions over patients who did not receive home care ($n = 11$) after hospital discharge. Surgical patients ($n = 190$) who were cared for after discharge by advanced practice nurses (APNs) had increased survival over patients receiving usual care ($n = 185$) when only 31% of the usual care patients received homecare services (McCorkle et al., 2000).

Because of changes in homecare financing, a steady overall decline in patients receiving homecare services has been observed (Murtaugh, McCall, Moore, & Meadow, 2003). Length of acute care stays are shorter (National Center for Health Statistics, 2001), and, despite advances in the electronic patient record and decision-support technologies, inadequate patient assessment, poor discharge organization, and poor communication across settings remain issues with discharge planning (Shepperd, Parkes, McClaran, & Phillips, 2004). Additionally, patients with cancer receiving care today may be older, have a later disease stage, and be more likely to receive aggressive therapies than 10 years ago (National Cancer Institute, 2005); therefore, an analysis identifying characteristics of patients with cancer during a time when home care was more available (1992–1997) may provide helpful guidance in today's environment.

This study applied what is known in the literature about patient characteristics associated with referrals and outcomes to guide the analysis of homecare referral for patients with cancer. The purpose of this study was to identify what patient characteristics predict a homecare referral for a cohort of patients following surgery for cancer, and what characteristics define patients who did not receive a homecare referral and had poor outcomes three months after discharge.

Methods

Design

This secondary analysis examined data from a quality-of-life study following surgical treatment for cancer at a large, academic cancer center in Philadelphia, PA (McCorkle et al., 2000). The independent variable selection was guided by a review of literature from 1985–

2007. Dependent variables included referral to home care after hospital discharge and poor discharge outcomes (rehospitalization, decline in function, or death) by 12 weeks.

The literature review revealed many characteristics associated with homecare needs, the likelihood of receiving a homecare referral, or of developing poor discharge outcomes (Bowles et al., 2003). Sociodemographic characteristics, such as advanced age (70 years or older), marital status (unmarried), education (less than 12 years), living alone, and lack of caregiver were identified. Health characteristics included number of comorbid conditions, self-rated health (fair or poor), cognitive or functional impairment, home-bound status, need for skilled nursing care, surgery during the acute-care stay, complications, suspected nonadherence to diet or medication, depression, multiple medications or therapies, and healthcare history. Specifically for patients with cancer, Yost, McCorkle, Buhler-Wilkerson, Schultz, and Lusk (1993) reported that being 50 years or older, having hospital stays longer than one week, and having moderate-to-high levels of symptom distress increased the likelihood of homecare referrals. Freiman and Breen (1997) found that older female patients with cancer who had previous hospitalizations for cancer; deficits in instrumental activities of daily living, such as preparing meals; and those who lived with others were more likely to use home care.

Sample

A sample group was enrolled in a randomized clinical trial to test the effectiveness of a home APN intervention. Participants had undergone solid tumor cancer surgery and their quality of life was compared to patients receiving usual care (N = 375). The entire sample was included in the first analysis because random assignment to experimental versus control groups occurred after the homecare referral decision was made. Approval was obtained for the original study from the university institutional review board and included the analyses conducted in this study.

Eligible patients were 60 years or older, admitted to a large, academic cancer center, diagnosed within the prior two months, and had a prognosis of six months or longer to live. Patients had to speak English, be alert and oriented (as determined by the primary or charge nurses), reside within 50 miles of the study site, and were expected to return home following solid tumor cancer surgery.

Of the 401 patients providing informed consent, 9 received noncancer-related surgery, and 17 others dropped out. Reasons for dropping out included institutionalized (n = 8), died (n = 3), and decided not to participate (n = 6). No statistical differences on the study variables were noted between the 375 subjects in the study and the 17 subjects who dropped out.

Procedure

All subjects received standard discharge planning and homecare referral procedures for adult patients at the site. Primary nurses assessed patients' discharge needs and implemented the discharge plans in collaboration with patients, family (if available), the physician, and hospital discharge planners.

The principal investigator trained two master's degree nursing students, blinded to the study hypotheses, as research assistants to collect sociodemographic data and health status characteristics on subjects prior to discharge and 12 and 26 weeks after discharge. The data, obtained by patient interviews and medical record reviews, included age, gender, race, education, marital status, income, living arrangement, caregiver status, insurance, employment, smoking history, medical diagnoses, number of comorbid conditions, medical and surgical history, symptom distress, functional status, and depression scores. Medical record audits by the research assistants, using a standardized form, collected data on cancer site, cancer stage at diagnosis, length of hospital stay in days, complications, plans for adjuvant therapies,

referrals to nursing or rehabilitation services, and whether the patient was rehospitalized within six months of discharge. Inter-rater reliability between the research assistants was at least 95%.

Instruments

Cancer stage was determined through surgical pathology reports and physician discharge summaries and classified as early stage (stages I or II) or late stage (stages III or IV) (Beahrs, Henson, Hutter, & Kennedy, 1992). Complications were identified from the medical record and subsequent interviews, and documented evidence of 35 conditions such as anemia, atelectasis, diarrhea, fever, hypertension, hypotension, hypoxia, infections, pneumonia, renal failure, and urinary retention were noted.

Functional status was measured using the **Enforced Social Dependency Scale (ESDS)** (Benoliel, McCorkle, & Young, 1980). The total dependency score is the sum of the social and personal dependency scores and can range from 10–51, with a higher score indicating worse status. The average Cronbach alpha (at baseline and at 12 weeks) in this study was 0.75. The personal dependency subscale of the ESDS measured impairments in eating, bathing, walking, traveling, dressing, and using the toilet. A total score of 24 or higher indicated functional impairment and corresponded to an average of four or more impairments out of six daily ability limitations.

The Symptom Distress Scale (SDS) (McCorkle & Young, 1978) assessed the presence and intensity of 13 symptoms, such as nausea, appetite, insomnia, pain, and fatigue. A score higher than 30 represented high symptom distress (McCorkle, Cooley, & Shea, 2000). The average Cronbach alpha was 0.78. The concentration item of the SDS served as a proxy for cognitive status, with a score of three or higher representing impairment (Sarna & Brecht, 1997).

The Center for Epidemiological Studies–Depression Scale (CES-D) (Radloff, 1977) was used to measure depression. Twenty items are rated on a four-point scale based on the previous week. Scores of 16 or higher indicate clinical depression. The CES-D has high internal consistency (0.85) and adequate test-retest reliability (average of 0.53 for different samples) (Callahan, Hui, Nienaber, Musick, & Tierney, 1994). The average Cronbach alpha in this study was 0.87.

The need for skilled nursing care variable was defined as the need for wound care or help using devices such as a tracheostomy tube, colostomy, or IV medication. Homecare referral was determined from the hospital record and service was verified through a homecare agency. Poor outcomes after discharge were defined as changes from fewer than four impairments at baseline to more than four impairments, rehospitalization, or death 12 weeks after discharge.

Data Analysis

All variables were dichotomized and the association of each variable as a correlate of homecare referral was determined using odds ratio and 95% confidence intervals. Stepwise, multiple logistic regression was used to show the odds of membership in the homecare group versus the group with usual care (Hosmer & Lemeshow, 2000). Variables were chosen for the stepwise, multiple logistic regression if they were independently related to homecare referral based on $p < 0.10$. Stepwise selection strategies (Hauck & Miike, 1991) included variables that were able to sustain statistical significance ($p < 0.05$). Other variable selection strategies such as forward selection and backward elimination, were tested to ensure result consistency. Bivariate correlations for all candidate variables in the logistic model were run to determine whether any would be high enough to cause collinearity concerns. All analyses were performed using SPSS® PC+.

Similar analyses were conducted in a subgroup of patients ($n = 127$) who did not receive the APN intervention and did not have a homecare referral. Patients who received the APN intervention were removed from the study because the intervention may have affected the outcome.

Results

Typical patients were married, white females with a mean age of 67.8 years ($SD = 5.77$). The most frequent cancer was prostate (21%), followed in decreasing frequency by gastrointestinal, breast, lung, gynecologic, and bladder. The least frequent was head and neck (8%). Thirty-two percent received home care. Fifty-two percent received adjuvant treatment (chemotherapy or radiation) within the first month after surgery. The average number of complications was 4.94 ($SD = 2.78$) with a range of 0–10 or greater. The average number of comorbid conditions was 2.61 ($SD = 1.55$), range 0–8. Average length of stay was 11 days ($SD = 17.64$), range 1–270. Demographic and health characteristics independently related to homecare referral are shown in Table 1. Resulting odds ratios ranged from 1.50 for less than a high school education to 4.01 for a length of stay less than one week.

Stepwise selection, using multiple logistic regression and previously identified variables, determined the variables listed in Table 2. Patients with eight characteristics (70 years or older, single, hospitalized for a week or more, late-stage cancer, more than four comorbid conditions, and discharged with more than four daily ability impairments, depressive symptoms, and a need for skilled nursing care) were significantly more likely to receive a referral for home care.

In the subgroup of patients who did not receive APN intervention and also were not referred to home care ($n = 127$), 27 (21%) had poor discharge outcomes at 12 weeks. Eight variables were univariate correlates of poor discharge outcomes, including length of stay greater than one week ($p < 0.006$), aged 70 years or older ($p < 0.079$), late disease stage ($p < 0.002$), more than four complications ($p = 0.053$), mobility impairment ($p = 0.010$), trouble concentrating ($p = 0.081$), need for skilled care ($p < 0.015$), and adjuvant therapy ($p = 0.085$). Resulting odds ratios ranged from 0.27 for trouble concentrating to 4.22 for late disease stage. In the final model, patients who did poorly had hospital stays greater than one week (odds ratio [OR] = 5.31, 95% confidence interval [CI] = 1.77, 16.00), were younger (OR = 0.15, 95% CI = 0.04, 0.60), without need for skilled care (OR = 0.13, 95% CI = 0.04, 0.47), reported no trouble concentrating (OR = 0.13, 95% CI = 0.02, 0.78), and received adjuvant cancer therapy (OR = 3.13, 95% CI = 1.05, 9.33) (see Table 3).

Discussion

The first analysis identified eight predictors of referral in this sample of patients with cancer. Similar to the literature, study patients were more likely to receive home care if they were aged 70 years or older, unmarried, had a long length of stay, multiple co-morbidities, impairments in daily living activities, depression, late-stage cancer, and needed skilled nursing care. The homecare referral rate for patients in this study (conducted between 1992 and 1997) was 32%, compared to 29% reported for a 1997–1999 cohort of patients with cancer by Locher, Kilgore, Morrissey, & Ritchie, (2006). Nationally, between 1996 and 1999, there was a 22% reduction in the likelihood of receiving homecare services for any diagnosis; demonstrating the dramatic effect of interim prospective payment on homecare use (Liu, Long, & Dowling, 2003). Murtaugh et al. (2003) reported an additional 8% decline by 2001, following the introduction of the prospective payment system. Overall, the use of homecare services declined by almost one-third from 1996–2001. These trends indicate the severe decline in homecare use and the need for clinicians who care for patients with cancer to be particularly mindful of the

characteristics identified in this study and the sequela of adjuvant therapy to avoid such dramatic declines.

Late-stage cancer was a significant predictor of referral in this study that has not been identified in previous studies. Patients with stage III or IV cancers were referred about 3.5 times more often (OR = 3.45) than stage I or II patients. Locher et al. (2006) reported that half of the patients with cancer referred to home care did not have cancer listed as their admitting diagnosis. This may be an indication that cancer alone is not a clear trigger for referral.

These reported study findings suggest that cancer stage and information about plans for adjuvant therapy are important when making informed referral decisions.

Impaired functional status clearly is the most frequently occurring predictor in many studies of homecare referral need (Bowles et al., 2002; Clemens & Hayes, 1997; Estes & Swan, 1993; Evans & Hendricks, 1993; Health Care Financing Administration [HCFA], 1992; Kane, 1994; McWilliam & Sangster, 1994; Naylor et al., 1994; Prescott et al., 1995; Solomon et al., 1993), supporting the importance of accurately assessing patients' functional and self-care abilities prior to discharge. Reilly et al. (1996) suggested that nurses consistently underestimate the functional ability of patients and overestimate patients' understanding of their treatment plans, indicating the need to more carefully assess patients' abilities. But accurate assessments can be difficult because patients are typically not required to dress, climb stairs, or do other self-care activities while hospitalized.

In the current study, being single was a significant predictor of homecare referral. The correlation between living alone and being single was 0.57 ($p < 0.001$), indicating single status may be a proxy for living alone. Living alone has been a predictor of homecare referral in several studies (Evans & Hendricks, 1993; HCFA, 1992; Kane, 1994; McWilliam & Sangster, 1994). Furstenberg and Mezey (1987) reported that discharge planners visited 94% of patients who lived alone, compared to only 40% of those who lived with someone. However, in the current study, when living alone (versus being single) was included in the analysis, it was not significantly correlated with those who received a homecare referral ($p = 0.401$). Similarly, in the HCFA (1992) and Bowles et al. (2002) analyses, living alone was not a strong predictor. Living alone may be a trigger for closer assessment, but the presence of other characteristics, such as an adequate support system, may negate concern over living alone. Further study is needed to explain the relationship among homecare referral, single status, and living alone.

Length of hospital stay was a characteristic of patients who received referrals and was related to poor outcomes in patients not referred. A length of stay longer than one week may indicate complexity, complications, and illness severity (Gornik, Gornik, & Gasparovic, 2007). Discharge planners should note length of stay when considering referrals.

Patients with depressive symptoms were almost twice as likely to receive a referral (OR = 1.93) than those not depressed, a finding that has implications for healthcare providers involved in discharge decision making. Given that less than 50% of all patients with cancer are properly diagnosed and treated for anxiety and depression (Lynch, 1995; Sellick & Edwardson, 2007), practical advice from Hoffman and Weiner (2007), including that clinicians expand the diagnosis of somatic symptoms to include depression, obtain the insight of people close to patients, and follow patients' moods over time, may be helpful.

A predictor in this study was a need for skilled care, which is a Medicare policy requirement to qualify for homecare reimbursement (CMS, 2007) and supported by others (Clemens & Hayes, 1997; Estes & Swan, 1993; Garrard, Dowd, Dorsey, & Shapiro, 1987; Shyu & Lee, 2002). However, the outcome analysis at 12 weeks found that patients without skilled needs also fared poorly, indicating that other factors suggest the need for homecare services and that

the Medicare policy limiting care to homebound patients with need for skilled care should be examined for its affect on outcomes. For patients with cancer, the need for home care may arise later from the effects of adjuvant cancer therapy or may relate to needs associated with adjuvant cancer therapy, an idea substantiated by this study's finding that adjuvant cancer therapy was a strong predictor (OR = 3.1, CI = 1.05, 9.33) of poor outcomes after discharge. Findings suggest that clinicians making the discharge referral decisions should anticipate the effects of adjuvant therapy when considering a referral or at least followup with patients to assess developing needs, particularly since the use of adjuvant chemotherapy and hormonal therapy has substantially increased (National Cancer Institute, 2005).

Shyu and Lee (2002) found poor cognition was a predictor of home care for elderly patients versus nursing home placement. No formal measurement of cognitive function was taken in the current study, but the fact that 20% of the patients who did not receive homecare referral had difficulty concentrating is troubling. However, concentration is not a predictor of poor outcome, suggesting that poor concentration is not an adequate indication of poor cognition. A more precise measure of cognitive function is needed (Naylor, Stephens, Bowles, & Bixby, 2005).

Limitations

Data were originally collected to test the effects of an APN intervention; therefore, variables that influenced discharge referral may not have been included. For example, the original study did not include a measure of cognition, medications used, or previous hospitalization. The study also is limited to patients enrolled at one medical center in the northeastern United States. Referral rates and reasons may differ at other sites. Another limitation may be differences between patients and referral rates during the study period and today. However, given that the current acute care situation for patients with cancer includes increased use of adjuvant and more aggressive therapies (National Cancer Institute, 2005), shorter lengths of stay (National Center for Health Statistics, 2001), and fewer patients receive home care than 10 years ago (Murtaugh et al., 2003), the findings remain clinically significant.

Cancer clinicians and researchers are encouraged to repeat this study to determine whether any new patient characteristics have arisen since the time of this assessment.

Implications

Study findings suggest agreement with others on multiple factors associated with homecare referrals. One factor unique to the study's participants was that cancer stage and the need for adjuvant therapy gained importance in the outcomes analysis. This information should be readily available when discharge decisions are made. Patients with late-stage cancers are highly likely to receive additional cancer treatment and, therefore, are at greater risk to develop complications associated with advanced cancer and treatment. Study findings draw attention to common sociodemographic and clinical factors, such as age, single marital status, depression, and cognition, that should be clues to the healthcare team to further probe into the patient's support systems and caregiver availability, willingness, and ability.

Discharge summaries that contain a description of the patient's functional status as they near discharge, along with a listing of cancer stage, numbers and types of comorbid conditions, and skilled needs would be helpful. The information is largely available in the patient record, but it is not routinely collected or organized to support the decision-making process. A need to develop standardized forms or electronic methods to synthesize relevant patient factors and make them available prior to discharge also exist. Factors such as depression and cognitive status, if not routinely assessed, also should be added to routine assessment using standardized instruments.

Continuity of care is another issue affecting accurate referral decisions. Knowing the patient, their needs, and abilities is important to making accurate discharge and referral decisions (Bowles et al., 2003). Staff consistency also is important for achieving continuity.

The interdisciplinary team of nurses, physicians, social workers, and discharge planners are responsible for making accurate referral decisions and choosing the best option to meet patients' needs. Access to comprehensive information and a full understanding of characteristics associated with the need for a referral may help clinicians make better decisions (Bowles et al., 2003, 2008). To offset the barriers to effective identification and referral to home care, clinicians should be alert for patients with the characteristics identified in this study, particularly ones specific to patients with cancer.

Key Points ...

- Identifying the characteristics of patients undergoing surgery for cancer who need homecare referral is important to ensure they receive needed care.
- Many patients who do not get a needed referral have poor outcomes after discharge, so clinicians should anticipate the effects of adjuvant therapy on outcomes after discharge and evaluate whether the patient should receive a homecare referral.
- Referral for homecare services may provide the monitoring and symptom management needed to avert costly outcomes.

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Table 1
Demographic and Health Characteristics Independently Related to Homecare Referral

Characteristic	Home Care (N = 120)		Without Home Care (N = 255)		Poor Outcome (N = 27)		Good Outcome (N = 100)	
	n	%	n	%	n	%	n	%
Age 70 years or older	57	48	75	29	4	15	32	32
High school or lower education	44	37	120	47	14	52	49	49
Length of hospital stay one week or longer	91	76	112	44	18	67	37	37
Single	51	43	79	31	8	30	35	35
Late disease stage	56	47	64	25	11	41	14	14
Four or more complications	71	60	110	43	15	56	35	35
Four or more comorbidities	34	28	35	14	6	22	14	14
Four or more daily ability impairments	73	61	91	36	8	30	34	34
High symptom distress (SDS score higher than 30)	49	41	72	28	7	26	28	28
CES-D score of 16 or higher	64	53	85	33	12	44	34	34
Mobility issues	77	64	129	51	16	59	44	44
Skilled need	70	58	100	39	5	19	44	44

CES-D—Center for Epidemiological Studies—Depression Scale; SDS—Symptom Distress Scale

Table 2
Multiple Logistic Regression Model for Correlates of Homecare Referral

Variable	Beta	SE	Odds Ratio	95% CI	p
Aged 70 or older	0.98	0.29	0.98	1.52, 4.69	0.0006
Single	0.574	0.29	0.574	1.01, 3.12	0.0475
Length of stay one week or longer	1.14	0.28	1.14	1.80, 5.47	0.0001
Late cancer stage	1.27	0.29	1.27	2.01, 6.32	< 0.0001
Four or more daily impairments	0.68	0.27	0.68	1.16, 3.36	0.0121
Depression score of 16 or higher	0.67	0.27	0.67	1.16, 3.28	0.0122
Skilled care need	1.33	0.28	1.33	2.17, 6.60	< 0.0001
Four or more comorbid conditions	0.90	0.27	0.90	1.31, 4.58	0.0049

CI—confidence interval; SE—standard error

Table 3
Multiple Logistic Regression Model for Correlates of Poor Discharge Outcome Among Patients Who Did Not Receive the Advanced Practice Nurse Intervention and Were Not Referred to Home Care

Variable	Beta	SE	Odds Ratio	95% CI	P
Length of stay one week or longer	1.67	0.56	5.31	1.77, 16.00	0.0030
Age 70 or older	-1.88	0.70	0.15	0.04, 0.60	0.0070
Need for skilled care	-2.04	0.65	0.13	0.04, 0.470	0.0018
Poor concentration	-2.00	0.90	0.13	0.02, 0.780	0.0257
Adjuvant treatment	1.14	0.56	3.13	1.05, 9.330	0.0401

CI—confidence interval; SE—standard error