Effects of Posthospital Informal Care on Nursing Home Discharge

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This study examines the effect of family caregiving on the probability that nursing home residents would be discharged to the community. The effect of the number of hours of informal care on the probability of nursing home discharge was estimated using a logistic regression of a 6-week postadmission location (home or institution) on the number of hours of informal care in the first 2 weeks in the nursing home, of caregiver visits, and other patient factors. The odds of being discharged to their home were higher for those who received more care that is informal. Informal care may increase the quality and the amount of care that residents receive, thus, influencing rehabilitation outcomes and returns to home. Caregiving families may advocate for residents and signal to nursing home staff that the resident has a well-functioning support system.

When older people move to nursing homes, they usually are not abandoned by their families. In fact, the norm is for families to maintain their ties to the older person through visiting and through continued involvement in care activities (Naleppa 1996). Much of the research on family involvement in nursing home care focuses on the role that families and, to a lesser extent, friends play in providing and receiving emotional support through their continued contact with the older

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person (Bitzan and Kruzich 1990; Dobrof and Litwak 1977; Montgomery 1982). This study examines the effect of informal care from family on the probability that the older person will be discharged from the nursing home to the community within 6 weeks of admission.

Dobrof and Litwak (1977) suggested that families should be encouraged to maintain ties with the institutionalized older person through a shared responsibility with the nursing home staff for the resident's care. A survey of residents and staff by Schwartz and Vogel (1990) revealed some discrepancy between staff and family views about roles and responsibilities. Although the staff believes that personal care is their responsibility, families have indicated an interest and willingness to provide at least some of the care.

A qualitative study suggested that families, in fact, do provide both activities of daily living (ADL) and instrumental activities of daily living (IADL) assistance to nursing home residents. Tickle and Hull (1995) observed and interviewed the families of 30 residents while they were visiting a nursing home. Some family members fed, shaved, and bathed residents. In addition, they did laundry, shopped, and changed bed linens. Unfortunately, the study did not report the proportion or frequency of family involvement in personal care activities. Family members noted that they provided care to improve the quality of care; as an expression of their love and commitment to their relative; and to provide continuity, sometimes in the form of familiar foods from home, with the resident's life before the nursing home. In another qualitative study, Bowers (1988) found that many family members of nursing home residents perceive a particular need for them to help the staff gain a sense of who their family member is and has been as a person. This perceived need is expressed by relatives of cognitively intact, as well as cognitively impaired, residents.

Professional wisdom suggests that families have an important rehabilitation role to play. Geriatric physicians, nurses, and rehabilitation therapists emphasize the importance of including the family as part of the rehabilitation team (Brody and Pawlson 1990). Family caregivers may directly influence the quality of care that the resident receives by adding to the rehabilitation efforts under the direction of the professionals in the nursing home.

These few studies have suggested reasons to expect a positive relationship between the amount of family care residents received during the postacute period and the probability of discharge from the nursing home. First, informal care may increase the quality of care that the resident receives from the paid caregivers in the nursing home or the total amount of care received from all sources, thus influencing rehabilitation outcomes and returns to home. The influence on rehabilitation may be direct. Families may actually help their family members to become more independent in ADLs by encouraging them to do self-care. Alternatively, the effect may act indirectly through staff efforts to engage available and willing families in rehabilitation activities.

In addition, families who deliver care in the nursing home may signal to nursing home staff that this resident has a well-functioning support and care system who are willing and able to provide care at home just as they are providing it during the nursing home stay. The experience of caring may also increase resident, family, and staff confidence in the resident's ability to manage at home. Moreover, caregiving families may serve as advocates for the resident with the staff. Consequently, those residents may get more care from the staff. The additional care may improve outcomes, including being discharged back home.

In summary, family involvement in nursing home care has been examined primarily with respect to emotional and psychological effects on residents and their families. The effects of family care on the probability that the patient will be discharged to the community have rarely been examined. An exception is Lewis and colleagues' (1985) discovery that visits by family or friends predicted short-term survival in a nursing home, but that they were not associated with being discharged back home or long-term survival. This study did not measure actual care, just visits. Nevertheless, most studies of predictors of nursing home discharge to a home or community setting invariably fail to include a measure of family involvement in the nursing home care (Berg and Mor 1995; Engle and Graney 1993; Garrard et al. 1990; Gillen et al. 1996; Greene and Ondrich 1990; Kiel et al. 1994; Liang et al. 1996; Liu, Coughlin, and McBride 1991; Murtaugh 1994).

This analysis uses data from a study of postacute care that followed a cohort of Medicare patients who were discharged from a hospital for up to a year (Kane et al. 1996). The current analysis examines the effect of family caregiving on the probability that the resident will be discharged to the community by 6 weeks after admission to the nursing home. In contrast to previous studies of predictors of nursing home discharge, a measure of the amount of informal care that the older person receives in the nursing home is included as a predictor. In addition, a separate measure of the time spent visiting the resident in the nursing home was included, and its effect on the discharge probability is distinguished from the effect of the time spent caregiving.

Methods

SAMPLE

The analytic sample was obtained from a study that examined short-term (6 weeks) and long-term (up to 12 months) postacute care outcomes for Medicare beneficiaries who were discharged from hospitals after a treatment of one of five conditions common among the elderly and known to require varying levels of postacute care: stroke, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), hip fractures, and hip procedures (Kane et al. 1996). Thus, the sample provides an opportunity to observe variation in postacute care and outcomes.

Participants were enrolled in the study between March 1988 and February 1989 from hospitals in three metropolitan areas: Pittsburgh, Pennsylvania (18 of 20 eligible hospitals participated); Houston, Texas (15 of 31 eligible hospitals participated); and Minneapolis/St. Paul, Minnesota (19 of 19 eligible hospitals participated).

Patients were interviewed just before their discharge and again at 6 weeks postdischarge. The patient's primary caregiver, defined as the person identified by the patient as providing the most assistance with care or arranging care in the 6 weeks after the hospital discharge, was interviewed 6 weeks postdischarge. Additional data collected included the patient's functional and cognitive status, and living situation. Finally, patient's degree of illness at discharge was measured with a composite sickness score adapted from the RAND study (Keeler et al. 1990). A score of 1 indicates that a patient had at least one of the following indicators of sickness at discharge: temperature, use of catheter, shortness of breath, abnormal heart rate, abnormal respiratory rate, elevated blood pressure, and cardiac arrhythmia.

Because this analysis focuses on the effect of postacute informal care on patients discharged from the hospital to a nursing home, patients discharged to their home (*n* = 1,560) or to rehabilitation facilities (*n* = 184) were excluded from the analyses. Of the 451 patients discharged to a nursing home, 72 (16%) reported that they did not have a caregiver. An additional 97 patients (22%) were not included in the analysis because the caregiver was not interviewed at 6 weeks because of logistical problems with data collection that were unrelated to the characteristics of patients or caregivers.[1] In summary, 282 patients and their primary caregiver met the following criteria for inclusion in this study:

1. The patient was discharged to a nursing home from the hospital.
2. The patient interviews at discharge and at 6 weeks were available for analysis.
3. The patient had a caregiver, and the 6-week caregiver interview was available for analysis.

Differences between the patients included in the analytic sample and those excluded because their caregiver was not interviewed were examined. Specifically, the probability that there was a caregiver interview for the patient was regressed on the patient's characteristics measured at discharge and on the patient's location at 6 weeks posthospital. The two groups did not differ on the probability of nursing home discharge at 6 weeks, with regard to gender, diagnosis related group (DRG), hospital discharge functional or cognitive status, sickness, or patient age.

MODEL SPECIFICATION AND ESTIMATION

The effect of informal care on the probability of nursing home discharge by 6 weeks posthospital was estimated using a logistic regression of the 6-week location (home or institution) on the amount of informal care given by the caregiver in the first 2 weeks posthospital discharge to nursing home, frequency of visits by the caregiver, DRG, illness severity, patient gender, and the functional and cognitive status at the time of discharge from the hospital. Because visiting is a prerequisite for giving informal care, the two concepts are inevitably linked. To eliminate problems with collinearity, we developed separate regression models using the amount of informal care and the extent of visiting separately.

Several recent studies of factors associated with nursing discharge and length of stay (LOS) suggest that empirical duration models are appropriate for examining questions about the timing of events (time until death or discharge) and handling the right censoring of these data (the arbitrary cutoff of observation of the LOS) (Greene and Ondrich 1990; Liang et al. 1996; Liu et al. 1991). Unfortunately, the patient's LOS in the nursing home was not available in the data set. Hence, the research question addresses the effect of informal care on discharge from nursing home within a specified time rather than on the specific timing or duration of nursing home care. The logistic model estimated that using transition by 6 weeks as the dependent variable is reasonably equivalent to a duration model for a 6-week period.

MEASURES

Dependent variable. Discharge from a nursing home is measured with a dichotomous variable indicating whether the patient was discharged home from the nursing home by the 6-week posthospital interview. As indicated in Table 1, residents discharged home by 6 weeks are coded as a 1, and those who are still in the nursing home or returned to the hospital are coded as a 0.

Independent variables. The caregivers' self-report of the number of hours of care that they provided at the nursing home in the first 2 weeks following hospital discharge was used as the measure of informal care. It is an estimate of the combined time spent on helping with personal care such as bathing, dressing, and toileting; with IADL activities such as housekeeping, cooking, and laundry, if it is required because of the illness; with arranging services and managing business affairs; and with general supervision and watching to make sure that the patient was safe. The amount of care was coded with three categories: 0 hours of care, 1 to 13 hours over 2 weeks, and 14 to 224 hours. Data on the hours of care provided by other informal caregivers were not available in the data set. As such, the variable covers the majority, but not the total hours, of the informal care received.

A separate measure of the time spent visiting the resident in the nursing home was included. Unfortunately, the interview question did not provide a category for caregivers who did not visit at all. Consequently, nonvisiting caregivers make up an unknown proportion of those who visited weekly or less. The variable is categorical as follows: caregiver visits daily, several times a week, or weekly and less.

The patient's functional status is measured with a weighted sum of seven functions: incontinence, bathing, dressing, toileting, transferring, feeding, and walking. The weighted ADL measure was developed specifically for the PAC study (for a detailed discussion, see Finch, Kane, and Philp 1995). It was developed through a magnitude estimation procedure to produce the weights (generated by a panel of experts in geriatrics) for each of the functional areas and for each level of impairment within the areas.

The weighted score is highly correlated with the conventional, simple count of ADL limitations. However, the weighted measure addresses problems inherent in other ADL and IADL measures. The weighted score does not assume that each area of limitation is equivalent to every other area. For example, the inability to use the toilet has a relatively high score of 848, compared to a little help with feeding (score of 424) and a little help with transferring (score of 401), which has nearly the same score as the person requiring help with toileting (score of 825). The weighted score for each function was summed to produce a total dependency score. Higher scores reflect higher levels of disability. Values on the scale range from 0 to 5,431 (patient needs complete assistance with all seven ADLs).

Cognitive status was measured with the Short Portable Mental Status Questionnaire (SPMSQ) developed by Pfeiffer (1975) as the number of errors on the test. Higher scores reflect higher levels of disability. Values range from 0 to 10 wrong.

Table 1 summarizes all the variables included in the analysis. The table indicates how the variable is measured, its data source, and the reference category for categorical variables in the analysis.

Results

OVERVIEW OF SAMPLE

Table 2 summarizes the characteristics of patients and caregivers in the sample. The majority of patients discharged from a hospital to a nursing home were still in the nursing home at 6 weeks posthospital.

TABLE 1
Variables Specification

Variable	*Measurement*	*Source*	*Reference Category*
Probability of discharge from nursing home by 6 weeks postdischarge	1 = patient is discharged home by 6 weeks postdischarge	In-person 6-week patient interview	0 = patient is in nursing home
Patient functional disability score at hospital discharge	Points on the weighted ADL measure	In-person discharge patient interview	
Patient cognitive status at discharge	Number wrong on SPMSQ	In-person discharge patient interview	
Patient gender	1 = female	In-person discharge patient interview	0 = male
Patient age	Year	In-person discharge patient interview	
Patient illness is stroke	1 = DRGs 14, 1, 5	Patient medical record	Patient illness is hip fracture
Patient illness is CHF	1 = DRG 127	Patient medical record	Patient illness is hip fracture
Patient illness is hip procedure	1 = DRGs 209, 210, 211	Patient medical record	Patient illness is hip fracture
Composite sickness score at discharge	1 = at least one indicator	Patient medical record	0 = no sickness
Caregiver visits nursing home			
weekly or less	1 = Yes	6-week telephone caregiver interview	Caregiver visits weekly or less
several times a week			
daily			
Caregiver hours of care over 2 weeks	1 = Yes	6-week telephone caregiver interview	Caregiver provides 0 care hours
zero			
1 to 35			
over 224			

NOTE: ADL = activities of daily living; SPMSQ = Short Portable Mental Status Questionnaire; CHF = congestive heart failure; DRG = diagnosis related group.

TABLE 2
Characteristics of Study Sample:
Means and Proportions (*n* = 282)

	Percentage
Patient characteristics	
Patient is home by 6 weeks postdischarge from hospital	34
Female	77
White	97
Age	
Mean	83
SD	6.9
Cognitive status score at discharge (number wrong on SPMSQ)	
0	13.5
1 to 2	33.7
3 or more	52.8
Patients with at least one sickness indicator at discharge	41
DRG	
Stroke	23
COPD	0
CHF	6
Hip procedures	10
Hip fractures	61
Functional status score at discharge	
Mean	3,097.7
SD	944.3
Caregiver characteristics	
Female	69
Age	
Mean	59
SD	14.4
Caregiver works outside the home	44
Relationship to patient	
Spouse	16
Adult child	50
Other family or friend	30
Missing	4
Has at least one minor dependent at home	13
Amount of caregiving in the nursing home over 2 weeks	
0 hours	8.5
1 to 34 hours	31.9
35 to 224 hours	58.2
Missing	1.4
Caregiver visits	
Daily	53
Several times a week	25
Weekly or less	13
Missing	9

NOTE: DRG = diagnosis related group; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure.

The average age of the patients was 83 years, and they were predominately female and White (97%).

At discharge, patients were relatively cognitively impaired, with 52% making 3 or more errors out of 10 on the SPMSQ. With respect to functional disability, patients were quite impaired at their discharge to a nursing home (mean = 3,097.7 on a scale in which a score of 5,431 indicates that the patient needs complete assistance with all seven ADLs).

Table 2 additionally summarizes the characteristics of the primary informal caregivers. The majority were female, with an average age of 59 years. The majority visited the patient daily or several times a week. One half of the caregivers were the patient's progeny. A smaller group were friends or other relatives (e.g., nieces, nephews, siblings) of the older person. A minority of caregivers were spouses. This is not surprising given the average age of the patients, many of whom are widows. A minority of caregivers (13%) had a dependent under age 18 at home. Close to 50% were employed outside the home.

Caregivers were asked to distinguish between providing ADL and IADL assistance and simply visiting the resident. About 91% of the residents received some informal care from the primary caregiver while in the nursing home. The majority of caregivers provided over 35 hours of care over 2 weeks. The majority of the caregivers also visited the resident daily.

As indicated in Table 3, the frequency of visits and the amount of care provided by caregivers are not independent (chi-square = 61.1, $df = 4$, $p < .001$). As indicated in the table, caregivers who visit more often also give more care. The Spearman rank order correlation of .47 ($p = .01$) confirms the positive direction of the relationship. The relatively high correlation suggests that, although caregiving and visiting are not the same activity, they overlap. However, at least 4.7% of caregivers who visit do not provide the older person with any personal care, IADL assistance, or supervision.

THE EFFECTS OF INFORMAL CARE ON NURSING HOME DISCHARGE

Approximately 34% of the residents in the sample were home by 6 weeks posthospital discharge. Table 4 summarizes the results of the

TABLE 3

The Relationship Between Visiting and Caregiving

	Amount of Care Provided (%)			
Visits	*None*	*1 to 35 hours over 2 weeks*	*More than 35 hours over 2 weeks*	*Total*
Weekly or less[a]	9 (3.5)	26 (10.2)	1 (0.4)	36 (14.1)
Several times a week	8 (3.1)	56 (22)	6 (2.4)	70 (27.5)
Daily	4 (1.6)	74 (29)	71 (27.8)	149 (58.4)
Total	21 (8.2)	156 (61.2)	78 (30.6)	255 (100)

NOTE: Chi-square = 61.1, $df = 4$, $p < .001$.

a. Data were coded such that caregivers who did not visit at all are indistinguishable from those who visited less than weekly.

logistic regression model to estimate the effect of each independent variable on the probability of the residents being home by the 6-week interview. Caregiver characteristics were not included in the final models presented here because none were significantly different from zero, and they contributed to large standard errors for the estimates of effects of other variables. Thus, we concluded that the deletion of caregiver characteristics yielded a better specified model with more stable estimates.

We first estimated a logistic regression of the effects of resident characteristics, caregiving, and visiting by the caregiver on the resident's probability of being discharged from the nursing home. Visiting did not influence the odds of discharge ($p = .68$). In this model, the odds ratio for low caregiving (compared to none) was 17.9 and the confidence interval ran from 1.82 to 177.39. The results were similar for high levels of caregiving. In addition, when visiting and caregiving are in the same model, the confidence intervals for other resident variables widen. Consequently, we concluded that collinearity was a problem, and we estimated separate models, one including visiting and the other including caregiving. The results are presented in Table 4.

The first regression results in Table 4 show the effect of visits by the caregiver on the probability of the resident being discharged, controlling for patient factors. Residents who were visited daily were no more or less likely to be discharged than those who were visited less frequently. The second regression, with three levels of caregiving (including 0 hours as the reference), indicates that residents who received between 1 and 35 hours of care from a family caregiver were

TABLE 4
Predictors of Nursing Home Discharge by 6 Weeks:
Odds Ratios and 95% CI (n = 278)[a]

	With Visiting Included			*With Amount of Care Included*		
	Odds Ratio	*95% CI*	p	*Odds Ratio*	*95% CI*	p
Patient is female	1.05	0.461, 2.37	ns	0.88	0.43, 1.8	ns
Patient age	0.96	0.92, 1.01	ns	0.96	0.92, 1.00	ns
Discharge cognitive status	0.83	0.73, 0.94	0.004	0.87	0.77, 0.97	.01
Sickness score	0.48	0.24, 0.93	0.03	0.43	0.23, 0.82	.01
DRG is stroke	0.60	0.25, 1.42	ns	0.77	0.35, 1.69	ns
DRG is CHF	0.26	0.05, 1.36	ns	0.20	0.04, 1.04	ns
DRG is hip procedure	5.3	1.73, 16.4	0.003	6.5	2.15, 18.68	.0009
Patient discharge functional status	0.98	0.96, 1.00	ns	0.98	0.96, 0.99	.04
Visits daily[b]	1.31	0.53, 3.2	ns			
Visits several times a week	1.54	0.60, 3.98	ns			
1 to 35 hours of care[c]				5.02	1.17, 21.50	.03
More than 35 hours of care				7.23	1.58, 33.03	.01

NOTE: With visiting included, Cox and Snell pseudo R^2= .22; with amount of care included, Cox and Snell pseudo R^2 = .25. CI = confidence intervals; DRG = diagnosis related group; CHF = congestive heart failure.
a. Twenty-five cases deleted due to missing data.
b. Visits weekly or less is reference category.
c. No caregiving is the reference.

five times as likely to be discharged by 6 weeks as those who did not. Those who received over 35 hours of care were seven times as likely to be discharged. In addition, the odds of being discharged by 6 weeks were lower for sicker (odds ratio = .43, p = .01), and more cognitively and functionally impaired residents. Finally, residents admitted to a nursing home after hospital treatment for hip procedures were 6.5 times as likely to be discharged as those with other diagnoses.

Discussion

This study examined the effect of informal care from the family on the probability that the older person would be discharged from the nursing home to the community within 6 weeks of admission. Caregivers were, on average, providing 10 hours a week of care to their family member. After taking account of the resident's health and functional status, those who received informal care from family members during the nursing home stay were much more likely to be discharged back home by 6 weeks. Visiting by the caregiver did not influence the likelihood of discharge. Thus, care itself, and not the simple presence of a caregiver visiting daily, affects discharge from the nursing home.

This study shows that families provide hands-on care even when a family member is in a nursing home. Moreover, the care matters. Family care in the nursing home greatly increases the likelihood of being discharged back home within a relatively short time. As the amount of care increased, the odds of discharge increased, suggesting a dose effect.

This study cannot definitively explain the relationship between informal care and discharge. To examine this relationship more closely, we categorized residents by whether their functional status score at hospital discharge, when compared to their functional status score at 6 weeks posthospital, showed functional decline, no change, or improvement; and whether they received family care or not (table not shown). There was no association between the receipt of family care and the change in functional status over the 6 weeks (chi-square = 2.3, $df = 2$, $p = .311$). However, the results from the multivariate logistic regression show that functional status has an independent effect (independent of family care) on discharge: More disabled people are less likely to be discharged. In addition, family care affects discharge independent of functional status: More family care increases the probability of discharge. Therefore, family care influences discharge, but not by improving functional status.

Although this study was not designed to identify how family care influences discharge, there are several possibilities for further study. In particular, caregiving families are an obvious indicator to nursing home staff that the resident has an active, functioning care situation available in the community. Moreover, the experience of caregiving in the nursing home may result in greater confidence on the part of the older person, the family, and the nursing home staff about the resident's safety and ability to manage at home.

The research literature offers few insights into how nursing home staff interacts with family members and gives little reason to think that any purposive harnessing of family energy occurs. In an ethnographic study, Foner (1995) found that the nursing staff has negative perceptions of family members who visit frequently, even when the staff takes for granted the help with ADL and IADL activities (e.g., feeding, laundry, mobility assistance) performed by those family members.

Moreover, aides' attitudes toward family members tended to be negative regardless of what family members did. Family members who disrupted the aides' schedules with requests were resented. As Foner writes, "A wet bed, a resident who has slipped down in a chair, food that has spilled on the floor—these to the aide are the realities of nursing home life." (p. 73) As such, they resent being summoned for what they regard as a minor matter. Oddly enough, however, frequently visiting family members who make no demands and who uniformly provide actual care to their relatives and perhaps even to their relative's roommates were also resented. A common complaint is that they are spoiling the resident by raising expectations for a high standard of attention. If these are the prevalent attitudes, much conscious attention would be needed to create a truly synergistic relationship between paid caregivers and caregiving families in the nursing home.

In addition to residents with informal care, hip procedure patients were also more likely to be home by 6 weeks. This finding is consistent with the clinical course of the illness. These patients are healthier (the procedure is elective), and they tend to recover more quickly as a result. Consistent with other studies of nursing home discharge, higher levels of functional and cognitive impairment decrease the odds of being discharged back home.

This study has several limitations. The findings are conditioned on two important factors that should be considered when generalizing to other groups. First, all the older people in this sample identified a primary caregiver. Although the vast majority of older people with functional impairments have one or more family members involved in their care, a subgroup is without informal support. It is possible that the effect of the number of hours of care would be different if older people without family caregivers were added to the group of caregivers (8%) who did not provide any care in the nursing home.

Second, the analyses are restricted to patients discharged from a hospital directly to a nursing home. Patients who enter nursing homes from community settings are not considered. The sample describes the majority, but excludes an important subgroup of older people.

This study adds to the large body of literature on effects of informal care and extends findings to the effects on nursing home residents. The next step is to determine what family caregivers do that improves the odds of nursing home discharge and what nursing home staff and other health care providers—those managing care from outside the nursing home—can do to help enhance those outcomes.

NOTE

1. Caregiver interviews were more likely to be missing when the patient discharge interview was done by a research firm that was later terminated for nonperformance of the contract. Specifically, the firm was not getting interviews with patients or caregivers completed in a timely manner.

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