The Immediate and Subsequent Outcomes of Nursing Home Care

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Abstract: To determine the relationship between admission status and subsequent outcomes, 563 patients discharged during 1980 from 24 nursing homes were followed through 1982. Only 28 per cent of patients were discharged to their homes. Reconstructed life histories of 529 discharges for the two-year follow-up revealed only 38 persons (7.2 per cent) were alive and at home; of these, 36 had been initially discharged to their homes. Four hundred and one persons (75.8 per cent) were dead. Mental orientation, urinary continence, functional status, hip fracture, and diagnoses associated with dementia were found to be significant predictors of outcome status after discharge and at follow-up. Social support had only a modest effect on the former outcomes. (*Am J Public Health* 1985; 75:758–762.)

Introduction

The present and projected growth of the oldest segments of our population has created concern about the use of acute and long-term care institutions. For the most part, the acute and long-term care systems of care have been approached as separate enterprises, but the pressures created by prospective hospital payment have stimulated new interest in the linkages. As prospective strategies are extended to the nursing home, attention to the interdependence of the two institutions will increase.[1,2]

As we move toward a new era in care and its financing, emphasis has shifted subtly from process to outcome. For both cost and quality purposes, we need to understand better the fate of patients and the factors that affect their outcomes. Scant data are available to project outcomes of nursing home patients. The largest source is derived from the 1977 cross-sectional national survey of nursing homes, which reported that three-fourths of the patients discharged were alive, although some were known to have died subsequently in the hospital.[3]

A six-month follow-up of Veterans Administration nursing home patients indicated that 6 per cent had been readmitted to the hospital, 39 per cent were still in nursing homes, 26 per cent were in the community, and 30 per cent were dead.[4] At the end of three months, 13 per cent of hospitalized patients discharged from VA hospitals to three types of skilled nursing care programs had died, and 10 to 28 per cent had been readmitted to the hospital.[5] Densen described the outcomes of care for persons discharged from seven community nursing homes.[6] At three months following discharge, 11 per cent of patients were living in their own homes; the six-month mortality rate was estimated as 32 per cent.

Other investigators have reanalyzed secondary data to estimate the outcomes of nursing home care. Analysis of secondary data suggests that almost one-half of patients discharged from nursing homes are dead or die soon after discharge.[8,9] Using death records from a cohort of Alameda County, California residents to recreate histories of care, Vicente, *et al,* report that of 455 persons, 77 persons had been admitted to nursing homes and only 22 per cent were discharged to their homes.[10] Approximately one-fourth of the persons admitted to nursing homes died somewhere other than the original nursing home, usually in an acute care hospital.

Several studies have assessed the risk factors associated with admission to nursing homes but few have studied the determinants of discharge outcomes.[11–17] Increased risk of nursing home admission has been associated with the presence of mental disorientation or multiple medical problems in the face of inadequate social support.[18–20]

The purpose of this study of 563 patients was to identify which patient characteristics on admission to the nursing home were associated with various statuses immediately after discharge and two years later. Our research was guided by previous studies that suggest three categories of variables influence patient outcomes: 1) characteristics of the nursing home resident; 2) nursing care needs as reflected by functional status; and 3) social support. One hundred and ninety-seven of the 563 patients were first nursing home admissions. Elsewhere we report the health care utilization patterns for this subset of patients.[21]

Methods

A sample of 24 nursing homes, stratified by bed size, was randomly selected from 47 nursing facilities in the metropolitan areas of San Bernardino-Riverside Standard Metropolitan Statistical Area in Southern California. All homes were classified as skilled nursing facilities (in California, over 90 per cent of nursing home beds are so designated). From a list of all patients discharged during 1980 from the 24 nursing homes, a random sample of patients was selected stratified by bed size and total number of discharges from each facility.

Patient characteristics recorded on admission or within one week of admission were abstracted from nursing home medical records. Indicators of social support were living arrangements and frequency and number of visitors as obtained from nursing notes. The visit score, based on the product of numbers and frequency of visits by friends and family, ranged from 0 to 20. Functional status included activities of daily living (ADL), mobility, mental status, bowel and bladder continence, behavior problems, and medications. The ADL score at admission was obtained by summing the amount of assistance needed in six areas (bathing, toileting, eating, dressing, transferring, grooming). A score of 6 indicated independent performance and a score of 18 indicated total dependence. Several sources were used to verify these data including hospital discharge summary, order sheets, and notes by the attending physician, charge nurse, and activity director.

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The patients' discharge status, location, and date of discharge were obtained from the nursing home discharge sheet. Discharge status was recorded at the time of discharge from the nursing home, or from the hospital if hospitalized (immediate discharge status), and at the end of two years after the initial nursing home discharge.

Patients who were discharged alive were traced by contacting the person or institution identified in the discharge summary. Letters were sent to family or friends requesting permission to contact for follow-up information on all patients. Follow-up telephone interviews obtained a history of the patient's subsequent utilization of health care facilities, and time at home until death or December 31, 1982. Hospitals and nursing homes were contacted to verify admission/discharge dates and discharge status. The vital statistics files were searched in the two counties to confirm date and place of death.

Analytic Techniques

Survival analysis was used to calculate the mortality experience of the study population.[22]

Five immediate outcome classes were used to describe the fate of patients upon discharge from the nursing home: 1) died in the nursing home; 2) returned home (this category includes those transferred to non-health care institutions, i.e., board and care and retirement homes; 3) transferred to another nursing home; 4) transferred to a hospital and died; and 5) transferred to a hospital and survived. The subsequent outcomes at two years were: alive or dead, and if alive, the location: home or nursing home.

A series of logistic regressions estimated the probability of sequential dichotomous outcomes described in the text.[23] First we used all variables that were significant in univariate analyses as well as non-significant variables the literature suggested as important, such as (age, sex, marital status, social support, self-payment, and prior living arrangements). We used two dummy variables for the bladder continence variable: continent versus incontinent, and catheterized versus non-catheterized. Mental status was dichotomized as oriented versus non-oriented, and comatose versus non-comatose. Multicollinearity was controlled by the computer program, which does not enter variables if there are such problems. In the final analysis, we used the entire sample and entered only the variables that were statistically significant at a 0.1 level in the confirmatory analysis. The cutoff points to calculate prediction rates for each model were selected on the basis of equal weights for Type I (sensitivity) and Type II (specificity) errors.

Results

The characteristics of patients in the sample are similar to those reported in the 1977 Nursing Home Discharge Survey Sample.[3] The mean age was 80 years with 38 per cent males, 27 per cent married persons, and 32 per cent responsible for their nursing home costs. Patients' length of stay (LOS) in this sample closely corresponds to Keeler's estimates, calculated from the 1977 Nursing Home Discharge Survey.[8]

Immediate Outcomes

Thirty per cent of the patients died in the nursing home. Almost 28 per cent of the patients were discharged home or to community facilities (board and care and retirement homes), and 7 per cent were transferred directly to another nursing home. Thirty-six per cent of the patients were transferred to a general hospital, and 11 per cent died there within two weeks. Twenty-five per cent of the patients survived the hospitalization and transferred back to the original or other nursing homes.

Table 1 shows the relationship between patients' social and demographic characteristics, admission functional status measures and medical diagnoses, and the immediate discharge outcome. Age, sex, and marital status were not related to the discharge outcomes. Patients discharged home were more likely to pay for their own care, had better functional status, were more often continent, less often confused, and had fewer functional impairments. Conversely, those who died in the nursing home or upon transfer to an acute care hospital were less likely to pay for their own care, had more functional impairment (more persons with dependent ADL scores), and were more often confused and incontinent.

Patients with diagnoses of dementia were less likely to return home. Persons with hip fractures had the best chance of being discharged home.

The variables related to behavior problems and the frequency of visitors were analyzed in greater detail. Those patients who died or were transferred to other nursing homes were more likely to be hostile, abusive, disruptive, or to

TABLE 1—Patient Admission Characteristics and Immediate Outcomes

Patient Characteristics	All (N = 563)	Home (N = 161)	Transferred to SNF (N = 37)	Died in SNF (N = 165)	Transferred to Hospital	
					Died (N = 61)	Survived (N = 139)
% Male	38.0	38.0	38.9	37.6	53.3	36.6
% Married	28.5	34.2	39.2	31.5	27.6	24.4
% Visited	79.9	83.9	78.4	77.6	70.5	82.7
% Self-Pay	35.3	44.0	27.8	39.4	27.9	27.0
Mean Age	80.3	79.8	79.6	81.8	78.9	79.4
Functional Status						
% Continent	55.0	78.0	38.4	30.2	62.7	52.0
% Independent ADL	12.4	19.4	8.5	6.7	18.0	9.4
% Oriented	41.6	65.8	27.8	27.9	31.7	38.9
Selected Medical Diagnoses						
% Dementia	31.5	16.0	52.8	37.0	49.2	29.5
%Hip Fracture	12.5	21.8	16.7	9.1	6.6	7.9
% Cancer	7.9	4.5	5.6	13.9	4.9	5.8

SNF = Skilled Nursing Facility.

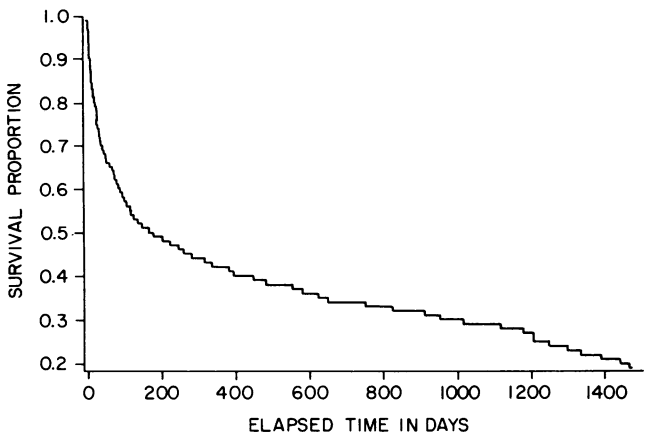

FIGURE 1—Survival Analysis of 529 Patients following Discharge from a Nursing Home (median survival time = 178 days)

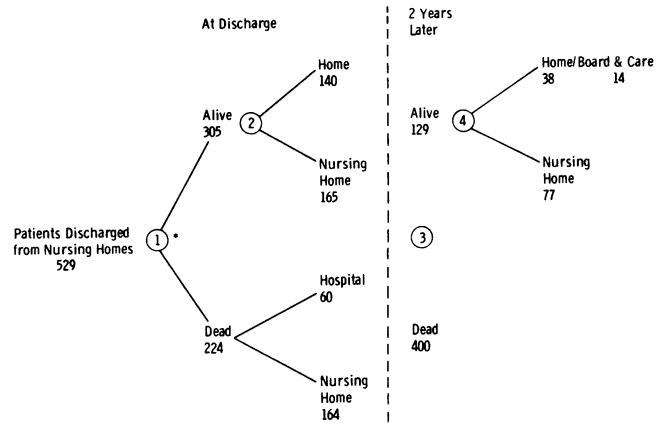

FIGURE 2—Major Outcomes of 529 Patients at Nursing Home Discharge and after Two Years (circled numbers indicate logistic regression equations in Table 3)

wander away from the nursing homes. Patients who were visited frequently during the first month (6–15 visits) had similar outcomes to those who were visited moderately (3–5 visits) or infrequently (0–2 visits).

Subsequent Outcomes

All but 34 of the 563 patients in this discharge cohort were traced for at least two years following discharge (94.5 per cent). Of the 529 patients who could be followed completely, 400 (76 per cent) had died, 277 in nursing homes, 110 in hospitals, and 13 in their own homes. Figure 1 illustrates the proportion of these patients surviving over the study period. The median survival time was 178 days.

During the two-year follow-up, 242 patients were hospitalized on one or more occasions. Of these 242 patients, 50 per cent survived less than 60 days after hospitalization. Only 38 (7 per cent) of the 529 patients traced were alive in their own homes two years after initial nursing home discharge (36 had been initially discharged to their homes). Another 14 were in retirement homes or board and care facilities. Twenty-two of the 36 persons initially transferred to another nursing home on discharge had died sometime in the intervening two years.

Table 2 relates the characteristics of these patients to their status two years after discharge from the nursing home. Although age and marital status were not associated with the two-year outcome, fewer of those alive at home were males. Neither the ability to pay for one's own care nor the frequency of visitors influenced the two-year outcome. High levels of independence in ADLs and bladder continence were strongly associated with being alive at home. Fewer patients at home had exhibited behavioral problems, i.e., abusive, wandering, and disruptive.

Logistic Regression Analysis

Several steps in the outcomes of nursing home patients can be identified. These are traced for our sample in Figure 2. For several of these transition points, indicated by a circled number on the figure, logistic regression was utilized to estimate the effects of predictor variables. The results of the corresponding predictive equations are summarized in Table 3. Only the coefficients statistically significant at $p < .05$ are shown. When a less stringent standard ($p < .1$) was used, only one additional significant coefficient emerged; oriented was a significant prediction for equation 1 ($.27 \pm .39$).

The models are reasonably accurate in predicting the various outcomes. The prediction rates, corrected for the original distributional probabilities, range from 66 per cent to 72 per cent.

In general, many of the variables that influence the immediate outcomes are also significantly related to the corresponding outcome at two years, but there are some interesting exceptions.

TABLE 2—Patient Admission Characteristics and Two-year Outcomes

Patient Characteristics	All (N = 529)	Home (N = 53)	SNF (N = 77)	Dead (N = 399)
% Male	37.8	11.3	36.4	41.5
% Married	29.1	18.9	27.0	30.9
% Visited	79.9	81.1	83.1	79.1
% Self-Pay	36.1	49.1	33.8	34.8
Mean Age	80.3	80.8	78.5	80.6
Functional Status				
% Continent	37.9	75.7	43.8	33.0
% Independent ADL	11.9	23.1	21.3	8.8
% Oriented	49.6	88.5	54.6	43.6
Selected Medical Diagnoses				
% Dementia	32.1	3.7	36.4	35.1
%Hip Fracture	12.4	33.9	12.9	9.5
% Cancer	8.3	1.9	0.4	11.7

SNF = Skilled Nursing Facility.

TABLE 3—Significant Coefficients from Four Logistic Regression Equations to Predict Immediate and Two-year Outcomes with 95% Confidence Intervals

	Immediate		Two-year	
	Alive (vs Dead) (1)	Alive at Home (vs Alive in Nursing Home) (2)	Alive (vs Dead) (3)	Alive at Home (vs Alive in Nursing Home) (4)
Source of Payment				
Self-pay (0 = No, 1 = Yes)		.77 ± .51		
Social Support				
Visits (0 = No, 1 = Yes)	.55 ± .44			
Functional Status				
Oriented (0 = No, 1 = Yes)		.77 ± .52	.61 ± .45	1.54 ± 1.01
Hip fracture (0 = No, 1 = Yes)		.95 ± .70		1.19 ± .97
Continent (0 = No, 1 = Yes)	.65 ± .44	.60 ± .55		1.03 ± .82
ADL Score (6 = Indep, 18 = Dep)	−.13 ± .07	−.14 ± .11	−.22 ± .09	
Prediction Rate (%)	66	69	72	72

NOTE: Only beta weights significant at $p < .05$ are shown ± 95% confidence limits.

• *Social support* (reflected in visits by family or friends) predicted immediate, but not long-term, survival.

• *Ability to pay* for care, as evidenced by self-payment, did not predict survival, but was correlated with returning home (rather than to a nursing home). This, too, was evident at time of discharge, but not at two years.

• In terms of functional status, *patient orientation* and *continence* and the presence of *hip fracture* all correlated with residence at home, both immediately after discharge and at two years. However, there was a trend towards these being more important predictors of residence at two years.

• *ADL score* is the only variable that predicted survival at both the immediate and two-year time points.

Discussion

Our immediate discharge outcomes are similar to those reported by others.[3–9] It was possible to predict outcomes with fair accuracy by using relatively simple variables. The relevance of dementia, incontinence, and hip fractures seems obvious. Gender effects are consistent with other data indicating higher morality rates for males at all ages.[24]

Measures of social support are viewed as important factors in care of the sick elderly. Unfortunately, nursing home records do not provide a rich source of such information. Very simple indicators had to be used. The frequency of visits during the initial month of admission to the nursing home was significantly associated with immediate discharge status but not the patients' two-year fate. Survivors with the financial resources to pay for their own care were more likely to return home at the immediate discharge period rather than transferring to hospitals or other nursing homes. The results of the univariate analyses are reconfirmed in the logistic regression models.

It is encouraging to note that the predictions based on data derived from reviews of nursing home records abstracted by carefully trained data collectors produce predictions on the same order of magnitude as those from data collected by direct observation.[7] Such data can be important in developing more effective outcome-oriented measures of nursing home quality as well as forming the basis for a revised payment system which offers more socially desirable incentives.

The hospital plays a significant role in the continued care of nursing home patients. The complex patterns of patient transfer between nursing homes and hospitals are described in detail elsewhere.[21] Providing better primary care in nursing homes and reducing the tendency to transfer patients to the hospital require changes in the payment structure. Such changes may minimize the current tendency to offer debilitated patients with minimal functional capacity intensive procedures of expensive technology when more attentive personal care may be more appropriate.

To date federal reimbursement policies have failed to recognize the relationship between the acute and long-term care sectors. Both sectors serve the same patients at different times during the natural history of their nursing home care. Events in one sector can dramatically affect the other. Current policies which fund acute and long-term care from separate sources provide no incentives for linking these two sectors. The prospective reimbursement of hospitals will undoubtedly change the case-mix of nursing home admissions and may influence their discharge policies as well.

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Lowering Blood Cholesterol to Prevent Heart Disease

A Consensus Development Conference Statement of the National Institutes of Health has made several recommendations of interest to public health workers. These include (but are not limited to): educating public to adopt a diet with 30 percent of total calories from fat (saturated fat less than 10 percent of total calories) and cholesterol intake 250–300 mg. or less; new and expanded programs to educate physicans; encouragement of the food industry to develop and market foods that will make it easier for individuals to adhere to the recommended diet; food labeling to include sources and content of saturated and polyunsaturated fats and cholesterol; assessment of the impact of recommended changes. Copies of the statement are available through the Office of Medical Applications of Research, Bldg. 1, Rm. 216, NIH, Bethesda MD 20205.