Quality of Long-Term Care in Nursing Homes and Swing-Bed Hospitals

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By 1989, more than 1,100 hospitals in rural communities throughout the United States were using hospital beds as swing beds to provide both long-term and acute care. In this study, the quality of long-term care in swing-bed hospitals was compared with the quality of nursing home care, using patient outcomes along with both process and structural measures of quality. Several methodological and conceptual points on measuring and analyzing the quality of long-term care are discussed in this article. Data were analyzed on approximately 2,000 patients in four different primary data samples, three of which were longitudinal involving multiple follow-up points. An analysis of changes in patient status over time, hospitalization rates, rates of discharge to independent living, services provided, and certain structural indicators showed that (1) relative to nursing home care, swing-bed care is more effective in enhancing functional outcomes and discharge to independent living and in reducing hospitalization for long-term care patients, and (2) nursing home care appears more desirable than swing-bed care for long-stay, chronic care patients with no rehabilitation potential. Swing-bed hospitals have gravitated largely to admitting postacute long-term care patients. They do not typically compete directly with community nursing homes for chronic care patients. The greater effectiveness of swing-bed care for patients with near-acute long-term care needs suggests that this approach should be considered in urban communities

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and that we should scrutinize our current tendency to place in traditional nursing homes many patients who have at least some rehabilitation potential.

In mid-1973, premised on the assumption that needed long-term care in rural communities could be provided in empty acute care hospital beds, 25 hospitals in rural Utah began experimenting with what was subsequently termed the swing-bed approach (Aland and Walter 1978; Shaughnessy 1984; Hospital Peer Review 1982; Burton 1982). Hospital beds were used to provide both acute and long-term care, depending on individual patient needs. The Utah swing-bed program was established to meet the needs of rural residents who found it necessary to travel to distant urban areas to receive skilled nursing facility (SNF) care. Certain Medicare nursing home regulations were waived since the providers already met acute care standards (Shaughnessy et al. 1978; Shaughnessy, Breed, and Landes 1982). Reimbursement was designed to cover the incremental cost of providing long-term care in a setting already staffed and equipped to provide acute care (Pennell 1982; Holahan 1987; Schlenker and Shaughnessy forthcoming; Finkler 1987; Schlenker 1987).

Subsequent demonstrations occurred in Texas, Iowa, and South Dakota. By 1978, approximately 100 rural hospitals were participating in the four-state swing-bed program demonstration (Shaughnessy and Tynan 1985). The evaluation of the demonstrations found the approach cost-effective, and implementation was recommended for rural communities throughout the United States (Shaughnessy et al. 1980). Congressional response to this recommendation was embodied in Section 904 of the Omnibus Budget Reconciliation Act of 1980 (OBRA, P.L. 96-499). This was, in effect, the enabling legislation for a swing-bed program now open to over 2,200 rural hospitals throughout the country. Final regulations for the national program, issued in 1982, drew substantially from the experience with the demonstration programs. Before the formal start of the national program in 1982, the Robert Wood Johnson Foundation funded 26 rural hospitals in Kansas, Mississippi, Missouri, North Dakota, and New Mexico to serve as "model" hospitals whose initial experience in the national program would be disseminated to assist other interested hospitals throughout the country (Richardson and Kovner 1985; (Richardson and Kovner 1985; 1986) Kovner and Richardson 1987). The new national program began slowly. By January 1, 1984, only 149 of 2,266 eligible hospitals were providing swing-bed care. As experience with the model program

was disseminated, and as acute care and long-term care practices changed, especially with the implementation of Medicare's Prospective Payment System (PPS), the swing-bed approach took hold in considerably more rural communities. The number of participating hospitals increased to more than 1,100 by early 1989.

We found that long-term care patients admitted to hospital swing beds have considerably shorter stays than community nursing home patients (Brownlee 1982; Shaughnessy 1987). Even among skilled nursing facility (SNF) patients, swing-bed hospital patients have significantly more postacute problems such as recovery from surgery, intravenous catheter, dyspnea, and hip fracture within the last six weeks. Conversely, community nursing home patients are characterized by greater dependence in functional areas such as bathing, dressing, and grooming, and by a greater prevalence of more traditional long-term care problems such as urinary incontinence, mental status problems, bowel incontinence, and behavioral disorders (Shaughnessy 1987; Shaughnessy, Schlenker, and Silverman 1988). In general, swing-bed hospitals and nursing homes are not in direct competition for the same types of patients (Shaughnessy, Schlenker, and Silverman 1988). The two provider types have gravitated to reasonably complementary roles in most communities, with swing-bed hospitals serving the subacute or near-acute patient care market and community nursing homes serving the chronic care or more traditional long-term care market.

This raises a key question, however. Despite their tendency to serve patients with different needs for long-term care, is one provider type "better" than the other? In view of their experience as institutional providers of long-term care, are community nursing homes providing better long-term care than swing-bed hospitals? Or, given their experience in the acute care field, are swing-bed hospitals providing better long-term care? This paper documents the results of the research undertaken to assess the quality of long-term care provided in swing-bed hospitals relative to community nursing homes in rural areas.

METHODS

QUALITY OF CARE

That quality of care is characterized by a number of dimensions and perspectives is well established (Donabedian 1980; 1982; 1985). Ideally, quality should be measured through patient outcomes (Lalonde

1989; Shaughnessy 1989; Kane and Kane 1988). However, attributing outcomes to treatments is far-from-straightforward. Mitigating circumstances and risk factors quite apart from treatments can influence patient outcomes (Kane and Kane 1989; Shaughnessy, Kramer, Pettigrew, et al. 1987). This is exacerbated in the long-term care field where many outcomes must be monitored over relatively extended periods of time. Improvement in health status is not always possible nor appropriate to pursue for long-term care patients (Kane and Kane 1989; Shaughnessy 1985). At times, the most desirable outcomes are simply maintaining function, slowing the rate of regression of certain chronic problems, or minimizing pain and discomfort. However, despite recent and ongoing work to use outcomes in the long-term care field (Kane et al. 1983; Mitchell 1978; Shaughnessy 1985; Lalonde 1989; Mathematica Policy Research, Inc., and System Sciences, Inc. 1988; Kane 1988; Kramer, Shaughnessy, and Kaufman 1989 in preparation; Kramer et al. 1988), no comprehensive set of outcome measures or approaches to assessing outcomes has emerged that would preclude the utility of both process and structural measures of quality (Kurowski and Shaughnessy 1983; Shaughnessy, Kramer, Pettigrew, et al. 1987).

In this study, a comparative approach to measuring quality was used, assessing the quality of care for swing-bed patients relative to nursing home patients. The most significant results involve change in functioning and change in status for certain types of long-term care problems. Some social, emotional, and cognitive attributes of patients were examined as well. Although all possible dimensions of long-term care and all risk factors were not comprehensively studied, several hundred case-mix variables or risk factors were examined in employing case-mix adjustment using multivariate methods. Findings based on *overall trends and patterns of differences* using a variety of measures of quality of care are emphasized, rather than results for only one or two measures.

In measuring patient status outcomes, we evaluated not only patient status change between an initial and a final time point, but also the manner in which patient status fluctuated between the two time points. For example, an improvement in pressure sores measured only between admission and six weeks after admission can be misleading if the condition of the ulcers varied erratically between the two time points. Thus, in addition to simply assessing change between two time points that were reasonably far apart, we monitored the stability of the change or the patient's condition at interim time points.

SAMPLES

Three longitudinal samples and one cross-sectional patient-level sample were involved in the analyses. Primary data were collected on site for all samples. Forty-four swing-bed hospitals and 49 nursing homes from 18 states contributed to the various samples. While the samples of facilities were not random, they were selected to be as representative as possible for purposes of this study. To have adequate representation across states, swing-bed hospitals were selected from 18 of the 33 states with hospitals participating in the swing-bed program in 1984. Participating hospitals were then chosen randomly subject only to the conditions that they would participate in data collection (nearly all chosen hospitals agreed to participate) and that they in fact were providing long-term care in Medicare-certified swing beds. Nursing homes that contributed either patient- or facility-level data were randomly selected from the same 18 states from the population of rural nursing homes within 50 miles of the swing-bed hospitals. Medicare-certified nursing homes in swing-bed communities were chosen since they represented the most likely institutions to which swing-bed patients would have been admitted if swing-bed hospitals were not present. The number of states and providers was lessened for some patient samples to contain travel and data collection costs.

We are comfortable that the results typify swing-bed care throughout the country not only on the basis of the facility- and patient-level sampling procedures used, but also on the basis of the 40 to 60 site visits and patient care observations our study team made, including our clinical staff, throughout the course of the five-year evaluation. Specifics on data collection methods are available in other documents (Shaughnessy, Schlenker, et al. 1987).

The first longitudinal sample, called the six-week admission sample or the in-facility sample, comprised 426 swing-bed and nursing home patients who were followed weekly for six weeks or until discharge, whichever occurred first. This sample comprised separate random samples from four cohorts consisting of patients with confusion, incontinence, stroke, or hip fracture. Patient status and service use data were collected at each follow-up point. Although not yielding a random sample of all swing-bed and nursing home patients, these four problem areas were selected because of their representativeness of both traditional and near-acute long-term care problems. A total of 211 swing-bed patients from 33 swing-bed hospitals and 215 nursing home patients from 41 nursing homes in 18 states made up this sample.

The second longitudinal sample, termed the six-month admission

sample or longitudinal admission sample, comprised 347 swing-bed and nursing home patients followed monthly for six months. This sample included 142 swing-bed patients and 205 nursing home patients from 20 swing-bed hospitals and 35 nursing homes in 11 states. Unlike the six-week admission sample, patients in this sample were followed monthly for six months regardless of whether they were discharged from the facility or not. The data were the same as those collected for patients in the six-week admission sample, also including postdischarge data for discharged patients. Four separate random samples were selected from the same patient strata as the six-week admission sample (i.e., confusion, incontinence, stroke, and hip fracture patients). As with that sample, patients often belonged to more than one of the four strata or cohorts since a patient could have two or more problems (e.g., incontinence and stroke).

The third longitudinal sample was a six-month live discharge sample, consisting of a random sample of 337 swing-bed and nursing home patients followed monthly for six months after discharge. This was a random sample of 142 swing-bed patients discharged live from 20 swing-bed hospitals and 195 nursing home patients discharged from 25 nursing homes in 11 states. Data were collected monthly for a six-month period after discharge for all patients in the sample.

The cross-sectional sample comprised 552 swing-bed patients from 33 swing-bed hospitals and 540 nursing home patients from 40 nursing homes in 12 states. Long-term care patients were randomly selected from swing-bed hospitals and nursing homes primarily for purposes of comparing case mix in the two facility types.

Measures

Several utilization outcome measures were used: discharge home, hospitalization, stay until discharge home, stay until hospitalized, hospital days per month, readmissions to institutional long-term care, the percentage of days institutionalized, home health care provision after discharge, home health visits per month over the data collection period, physician visits per month during the institutional stay, physician visits after discharge, emergency room (ER) visits per month, ER visits during the institutional stay, and the percentage of days in an independent living environment. Depending on the nature of the outcome variable, different (multivariate) statistical techniques were used to adjust for case mix (discussed in the next section). The more salient

results involving discharge home, hospitalization, and physician visits are presented in the next section.

Patient status outcomes for 45 patient health status indicators were studied using different measurement approaches to assessing outcomes. Ten of the indicators pertained to activities of daily living (ADLs). One, the Katz ADL score, was a sum of six other dichotomous ADL indicators for bathing, dressing, feeding, toileting, transferring, and ambulation. Eleven other indicators characterized long-term care problems often encountered in nursing homes and other long-term care settings: fluid intake, bowel incontinence, urinary incontinence, skin ulcers, mobility impairment, surgical wound healing, dyspnea, tissue fluid swelling, diabetes mellitus, pronunciation problems, and speech problems. Indicators of cognitive, emotional, and social functioning impairments included confusion, comprehension problems, cognitive deficit, psychotic symptoms, wandering behavior, avoidance of activities, motivation level for social activities, participation level in social activities, negative affect, negative attitude, excessive dependency, and antisocial behavior. Results for selected outcome indicators, predominantly those in the cognitive, emotional, and social functioning group, are not presented, since the outcome measures proved less reliable than others. Several instrumental activities of daily living (IADLs) were also used, including ability to use the telephone, ability to handle finances, transportation, and housekeeping.

Methodologically, *five basic measurement approaches* were employed in analyzing patient status outcomes. The first measured change in patient status between an initial time point (e.g., admission or discharge) and a final follow-up time. Ordinary and logistic regression methods were used to adjust for case-mix or risk-factor differences between nursing home and swing-bed patients. The second measurement approach entailed Markov-chain transitions in patient status indicators from one time point to another, over a time series of several equally spaced observations on patient condition (Kolesar 1979; Lane et al. 1985; Basawa and Rao 1980). This approach was not used systematically since it was determined that the other four approaches yielded the same basic results and required less computer time (the iterative maximum-likelihood estimation methods for transition probabilities, combined with multivariate case-mix adjustment procedures for each such probability, were computationally cumbersome). The third approach involved measuring the length of time until an improvement or decline in health status occurred, yielding a continuous outcome measure (i.e., length of time until a given event). Cox-model survival analysis with covariates was used in analyzing

outcomes of this type, which permitted adjusting for case-mix differences between swing-bed and nursing home patients (Anderson et al. 1980).

The fourth measurement approach employed improvement or stabilization patterns for each of the 45 patient health status indicators on which outcomes were measured. Dichotomous variables were constructed to denote whether a consistent pattern of improvement or stabilization was manifest over a time series of several consecutive readings on each patient health status indicator. For each patient status indicator, two pattern dichotomies were constructed. The first denoted a pattern of improved status prior to the final data collection point, with the requirement that the condition never worsened between the initial point (e.g., admission) and each succeeding time point, including the final follow-up point. The stabilization or "nonworsening" dichotomy was similar, denoting that the patient's condition at the final data collection point was no worse than at the initial point, further requiring that the patient's condition did not worsen over the entire time interval. For both the improvement and stabilization pattern dichotomies, a zero indicates that the specified improvement or nonworsening did not occur. Logistic regression with covariates was used as the case-mix adjustment technique with this measurement method.

Continuous indicators of the percentage of time the patient spent in an improved or worsened state constituted the fifth approach to outcome measurement. This entailed calculating the actual time spent in an improved (worsened) state, relative to baseline, as a percentage of the entire time period over which patient health status observations were made for each patient. It therefore yielded a continuous outcome indicator that reflects another perspective on the stability of a patient's condition over time. Ordinary (multiple) regression methods were used to adjust for case mix. The most useful approaches to outcome measurement for purposes of these analyses proved to be the length of time until an event occurred, the improvement and stabilization pattern dichotomies, and the continuous indicators of the percentage of time in an improved or worsened state.

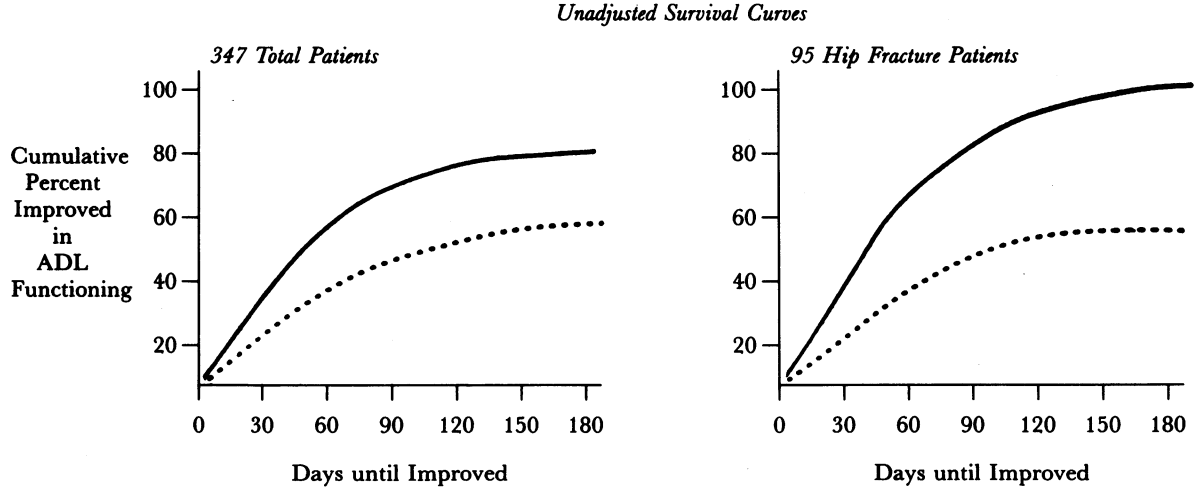
STATISTICAL ANALYSIS METHODS

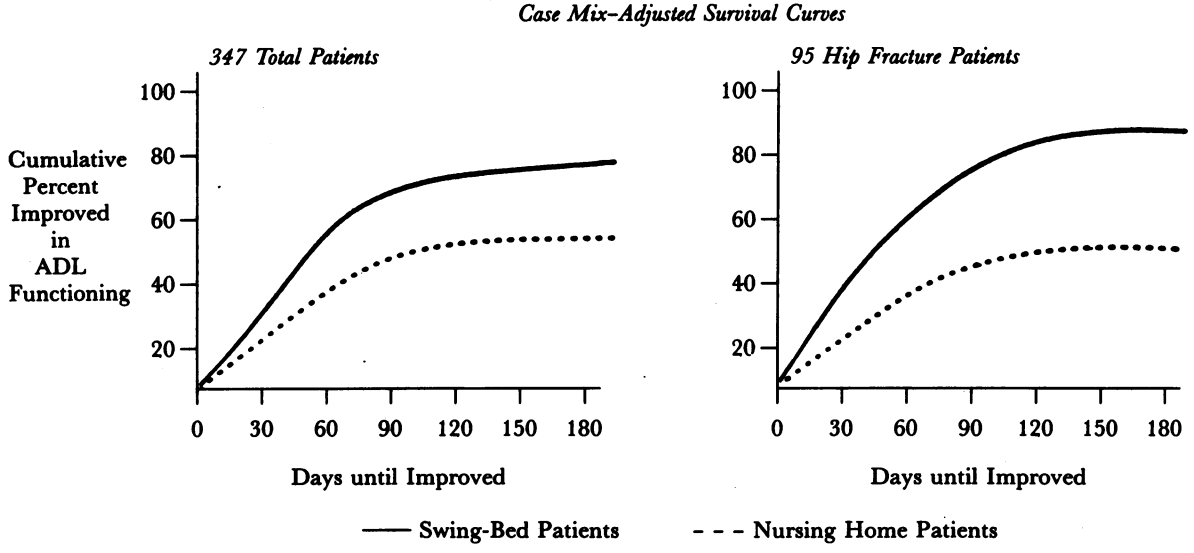
Attrition that occurred for the longitudinal samples (i.e., patients not followed for the full six-week or six-month duration, depending on the

sample) was dealt with through statistical methods, measurement, and stratification. For example, the survival analysis methods used not only adjusted for case-mix differences, they also took into consideration patients lost or "censored" during the follow-up period. Four methods were used to adjust for case-mix differences or risk factors that differed between swing-bed hospital and nursing home patients: case selection, Cox-model survival analysis with covariates, logistic multiple regression, and ordinary multiple regression. The latter three procedures all involved adjusting for covariates using multivariate statistical methods. We experimented with statistical standardization methods often used in epidemiological studies, finding that the multivariate procedures yielded the same results, but more efficiently.

Case selection was used uniformly to adjust for baseline differences between swing-bed patients and nursing home patients. For example, in comparing the extent to which two separate patient groups improve over time, if one group has a considerably larger proportion of patients not initially disabled on the indicator of interest, this group could not possibly have as high a proportion of its total patients improving as the other group. For dichotomous outcome indicators (i.e., the dichotomies denoting change between baseline and final follow-up and the improvement pattern dichotomies), this was remedied by restricting analyses only to patients who could improve relative to their initial state. Further, for the outcome pattern dichotomies, the initial distributions of patients in the two groups on the scale used to measure the patient status item of interest (e.g., a feeding scale ranging from 0 to 6) were also examined. If the relative frequency distributions (on the scale) for two groups were the same at baseline, then assuming no difference in the treatment effects, patients in the two groups would have an equal chance of improving. If the baseline distributions for the scale differed between the two groups (using a Kolmogorov-Smirnov test for distributional differences), however, case selection to compensate for baseline differences, combined with case-mix adjustment for other covariates using multivariate procedures, represented a more precise way to control for case-mix differences than either method alone. In analyzing improvement (stabilization) pattern dichotomies, patients not capable of improving (worsening) were always excluded. Case selection was also used to single out specific types of patients for analysis. The manner in which the multivariate covariate adjustment methods were used should be clear in the next section.

Figure 1: Swing-Bed and Nursing Home Patient Stays until Improvement in ADL Functioning





Based on 142 swing-bed and 205 nursing home patients in the longitudinal admission stratified sample. All pairs of curves presented here are significantly different at $p < .001$. Patients who died during the six-month interval were included in these analyses with a mortality indicator used as a covariate for case-mix adjustment. Results were the same when the mortality covariate was not used and such patients were excluded.

FINDINGS

PATIENT STATUS OUTCOMES

Unadjusted and case mix–adjusted survival curves for improvement in ADL functioning are presented in Figure 1. The outcome indicator is improvement in the Katz ADL score index. Survival analyses were conducted for all patients pooled in the six-month admission sample and separately for patients in each of the four evaluation cohorts. The curves in Figure 1 pertain only to the pooled and hip fracture patient analyses. Results for the additional three cohorts (i.e., confusion, incontinence, and stroke) were approximately the same as those depicted.

Adjusting for case mix involved analyzing a large number of case-mix variables using Cox-model survival analysis with covariates in a stepwise fashion. The total patient sample was adjusted for seven significant case-mix variables: rehabilitation potential, recovery from surgery, incontinence, the Katz ADL baseline score, toileting disability, mobility disability, and disability in using the telephone. The case-mix variables used to adjust the survival curve for hip fracture patients were rehabilitation potential, skin ulcer severity, toileting disability, incontinence, the Katz ADL baseline score, and disability in telephone use.

Patients discharged were followed outside the facility until the end of the six-month interval. The findings indicate that, even after case-mix adjustment, swing-bed patients improved sooner and more frequently in ADL functioning than nursing home patients in the six-month interval after admission. Results were similar for patients in the six-week admission sample and, although less pronounced, for patients in the six-month discharge sample. The conviction with which outcome differences can be attributed to swing-bed care versus nursing home care is weakest for the six-month discharge sample, since a larger number of external factors can influence patient status outcomes after discharge.

Multivariate survival analyses involving other patient outcome indicators showed a general trend toward improved functional ability after case-mix adjustment on the part of swing-bed hospitals, particularly for ADLs and selected IADLs, but not for cognitive, social, or emotional problems. In all, when patient status outcome differences persisted after case-mix adjustment using survival analysis, they demonstrated a *uniform tendency* for swing-bed patients to improve more frequently or more rapidly, or both, than nursing home patients.

The most systematic analysis of patient status outcomes entailed

the use of outcome pattern dichotomies. Each patient status outcome pattern dichotomy was adjusted for case mix using (multiple) logistic regression and case selection designed to yield approximately similar baseline distributions for swing-bed and nursing home patients on the health status indicator of interest. Tables 1 and 2 contain two illustrations of the case mix–adjustment methodology for patients in the six-week admission sample. The logistic regression model estimated in Table 1 is for the outcome pattern dichotomy of stabilization in bowel incontinence.

Table 1: A Case Mix–Adjusted Comparison of the Percentage of Swing-Bed and Nursing Home Patients Exhibiting an Outcome Pattern of Stabilization in Bowel Incontinence, Using Logistic Regression

*Rates and Odds Ratios for the Outcome Pattern of Stabilization in Bowel Incontinence**	
Unadjusted Stabilization Rates	
Swing-bed patients	83.0%
Nursing home patients	69.3%
Unadjusted swing-bed odds ratio	2.163
Significance	.019
Case Mix–Adjusted Stabilization Rates	
Swing-bed patients	83.0%
Nursing home patients	74.9%
Adjusted swing-bed odds ratio	1.638
Significance	.232
Logistic regression $R^2 = .177$	
Significance $< .001$	
Percent cases correctly classified = 80.4	

Independent Variables	*Coefficients*	*Significance*
Swing-bed care	0.49	.232
Good rehabilitation potential	1.48	.013
Confusion disability scale	-0.60	.048
Supine-to-sitting disability scale	-1.71	.013
Bowel incontinence scale	-0.79	.085
Communication disability scale	-0.32	.107
Constipation scale	-0.63	.052
Died in facility	-2.08	.092
Constant	3.43	—

*Based on patients in the in-facility stratified sample of 211 swing-bed and 215 nursing home patients followed for six weeks after admission in 1985/86 in 33 swing-bed hospitals and 41 nursing homes. The outcome variable takes on the value one if the patient exhibited the pattern of improved bowel incontinence as discussed in the text.

Table 2: A Case Mix-Adjusted Comparison of the Percentage of Swing-Bed and Nursing Home Medicare Patients Exhibiting an Outcome Pattern of Stabilized Ability to Conduct Activities of Daily Living, Using Logistic Regression

Rates and Odds Ratios for the Outcome Pattern of Stabilized Ability to Conduct Activities of Daily Living. *	
Unadjusted Stabilization Rates	
Medicare swing-bed patients	72.5%
Medicare nursing home patients	44.8%
Unadjusted swing-bed odds ratio	3.239
Significance	.010
Case Mix-Adjusted Stabilization Rates	
Medicare swing-bed patients	72.5%
Medicare nursing home patients	47.9%
Adjusted swing-bed odds ratio	2.863
Significance	.055
Logistic regression R^2 = .189	
Significance < .001	
Percent cases correctly classified = 78.6	

Independent Variables	*Coefficients*	*Significance*
Swing-bed care	1.05	.055
Bowel incontinence	-1.14	.043
Urinary tract infection (culture proven)	-1.71	.020
Severe feeding disability	-10.91	.052
Age	-0.13	< .001
Constant	11.44	–

*Based on Medicare patients in the in-facility stratified sample of 211 swing-bed and 215 nursing home patients followed for six weeks after admission in 1985/86 in 33 swing-bed hospitals and 41 nursing homes. The outcome variable takes on the value one if the patient exhibited the pattern of stabilized outcome discussed in the text.

In addition, the baseline or initial value for the patient status outcome indicator under consideration was further used as a risk factor or case mix-adjustment variable. The negative coefficient associated with the bowel incontinence scale (for which higher values reflect greater impairment) reflects the greater likelihood that patients more impaired in bowel incontinence will stabilize. As with the Cox-model survival analysis that employed covariates, such models were developed on the basis of clinical considerations and then empirically tested, eliminating variables whose coefficients were insignificant ($p < .25$). This logistic regression model includes eight independent variables, consisting of the swing-bed care dichotomy (i.e., an indication of

whether a patient is a swing-bed patient or a nursing home patient), along with seven case-mix variables, six of which have a negative coefficient. (A dichotomy denoting Medicare as a payer and a dichotomy denoting mortality/death were routinely used as covariates and stratifiers, with the same results. They are usually presented as covariates in this article.) Although the unadjusted outcome pattern dichotomy of stabilization in bowel incontinence was significantly higher for swing-bed patients than for nursing home patients prior to case-mix adjustment ($p = .019$), the significant difference was eliminated after case-mix adjustment ($p = .232$).

The logistic regression model in Table 2 pertains to the outcome pattern dichotomy of stabilized ability to conduct ADLs. It is restricted to Medicare patients in the six-week admission sample.

Although this logistic regression model has approximately the same explanatory power as the model in Table 1, risk-factor adjustment did not eliminate the significant ($p = .055$) difference between Medicare swing-bed patients and Medicare nursing home patients in terms of the pattern of stabilized ability to conduct ADLs. In this instance, the case selection procedure sufficed as a baseline adjustment procedure. The independent variables indicate that patients who are older, more disabled in bowel incontinence, or severely disabled in feeding ability, or who have urinary tract infections, are less likely to stabilize in terms of their ability to conduct ADLs. The conclusion from Table 2 is that a pattern of stabilized ADL ability during the six-week period after admission is more pronounced among Medicare swing-bed patients than among similar Medicare nursing home patients.

As an analogue to the outcome pattern dichotomies analyzed in Tables 1 and 2, outcome measures reflecting the percentage of time in an improved or stabilized condition were compared for swing-bed and nursing home patients. Ordinary (multiple) regression analyses were used to adjust the nursing home and swing-bed hospital differences for potential risk-factor or case-mix discrepancies between the two types of patients. Table 3 summarizes an illustrative portion of the results of the analyses of the improvement/stabilization outcome pattern dichotomies and the analyses of the percentage of time in an improved or stabilized state.

The case mix–adjusted results for the six-week admission, or in-facility stratified sample suggest that, in this relatively brief time period, swing-bed patients tend to improve and stabilize more rapidly than nursing home patients according to several outcome dimensions. This improvement pattern also substantiates the survival analysis

Table 3: Results for Selected Outcome Patterns and Percentage of Time Improved/Stabilized for Swing-Bed and Nursing Home Patients*

Outcome Pattern Indicator	Swing-Bed Hospital Mean: % Patients	Nursing Home Mean: % Patients	Unadjusted Mean Difference	Unadjusted Significance†	Case-Mix–Adjusted Mean Difference†	Case Mix–Adjusted Significance†
In-Facility Stratified Sample						
Improvement in						
Bowel incontinence	30.7	14.0	16.7	.010	19.5	.010
Bathing ability	26.3	13.3	13.0	.002	11.4	.022
Katz score	32.9	19.4	13.5	.005	11.1	.055
Feeding ability	29.5	18.0	11.5	.044	10.5	.094
Stabilization of						
Tissue fluid swelling	82.5	59.6	22.9	<.001	21.0	<.001
Katz score	77.2	42.5	34.7	<.001	33.2	<.001
Speech problems	82.8	65.7	17.1	<.001	10.3	.041
Longitudinal Admission Sample						
Improvement in						
Katz score	33.3	22.6	10.7	.048	11.4	.037
Bowel incontinence	36.1	19.3	16.8	.023	17.2	.041
Ability to prepare meals	15.5	6.0	9.5	.011	8.9	.047
Stabilization of						
Tissue fluid swelling	87.2	62.3	24.9	<.001	27.0	<.001
Speech problems	88.7	68.9	19.8	<.001	15.3	.005
Comprehension problems	87.2	75.8	11.4	.040	14.5	.032

Time Indicator‡	Swing-Bed Hospital Mean: % Time	Nursing Home Mean: % Time	Unadjusted Mean Difference	Unadjusted Significance†	Case-Mix–Adjusted Mean Difference†	Case Mix–Adjusted Significance†
In-Facility Stratified Sample						
Percent time improved in						
Bathing ability	19.8	11.6	8.2	.005	7.6	.030
Feeding ability	26.7	18.8	7.9	.069	5.1	.240
Percent time stabilized in						
Tissue fluid swelling	92.5	82.7	9.8	.001	8.8	.003
Katz score	89.9	73.2	16.7	<.001	11.7	.004

Continued

results discussed previously. The overall trends and findings persisted when Medicare and non-Medicare patients were analyzed separately.

The case mix-adjusted results for the six-month or longitudinal

Table 3: Continued

Time Indicator‡	*Swing-Bed Hospital Mean: % Time*	*Nursing Home Mean: % Time*	*Unadjusted Mean Difference*	*Unadjusted Significance*†	*Case-Mix–Adjusted Mean Difference*†	*Case Mix–Adjusted Significance*†
Longitudinal Admission Sample						
Percent time improved in						
Feeding ability	39.9	26.4	13.5	.010	15.8	.003
Meal preparation	11.0	5.5	5.5	.023	4.2	.080
Percent time stabilized in						
Tissue fluid swelling	94.7	83.4	11.3	<.001	12.5	<.001
Speech problems	96.2	86.9	9.3	.001	9.1	.001

* Descriptions of the samples, including sample sizes, length of follow-up, and nature of follow-up are provided in the methods section. The same outcome measures do not (and should not) necessarily agree across the two samples because of the different nature of the follow-up periods (weekly for six weeks and monthly for six months) and different patient locations (in-facility, discharged from facility, or both).

† The unadjusted significance levels for the pattern indicators are those of the odds ratio in a logistic regression model using only the zero/one swing-bed indicator as an independent variable. The mean difference was adjusted using logistic regression. The significance for the adjusted mean difference is the significance of the odds ratio, i.e., $exp(b)$, where b is the coefficient of the swing-bed versus nursing home dichotomy in a logistic regression model, with risk factors/case-mix variables in the model.

‡ The unadjusted significance levels correspond to those of the coefficient of the swing-bed dichotomy in an ordinary regression model without any other covariates. The adjusted mean difference was estimated directly from the coefficient of the swing-bed dichotomy in the ordinary multiple regression model with other covariates or risk factors present. The adjusted significance is the significance of the regression coefficient of the swing-bed dichotomy in the ordinary multiple regression model, with risk factors included in the model.

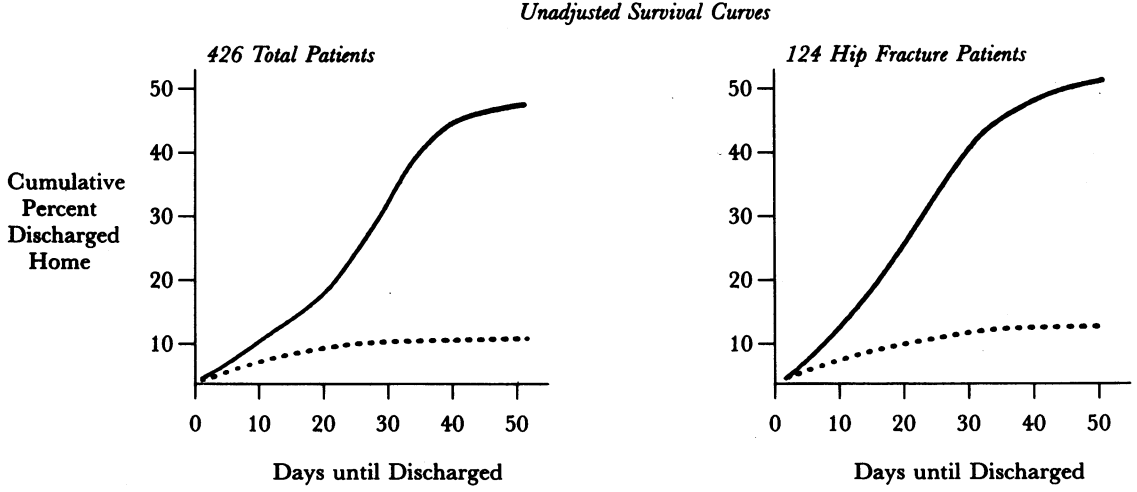
admission sample generally demonstrated fewer differences between swing-bed and nursing home patients than the corresponding results for the in-facility admission sample. Nonetheless, the overall pattern pointed to greater improvement and stabilization in swing-bed patients. These results also persisted for Medicare and non-Medicare patients separately.

DISCHARGE TO INDEPENDENT LIVING AND HOSPITALIZATION

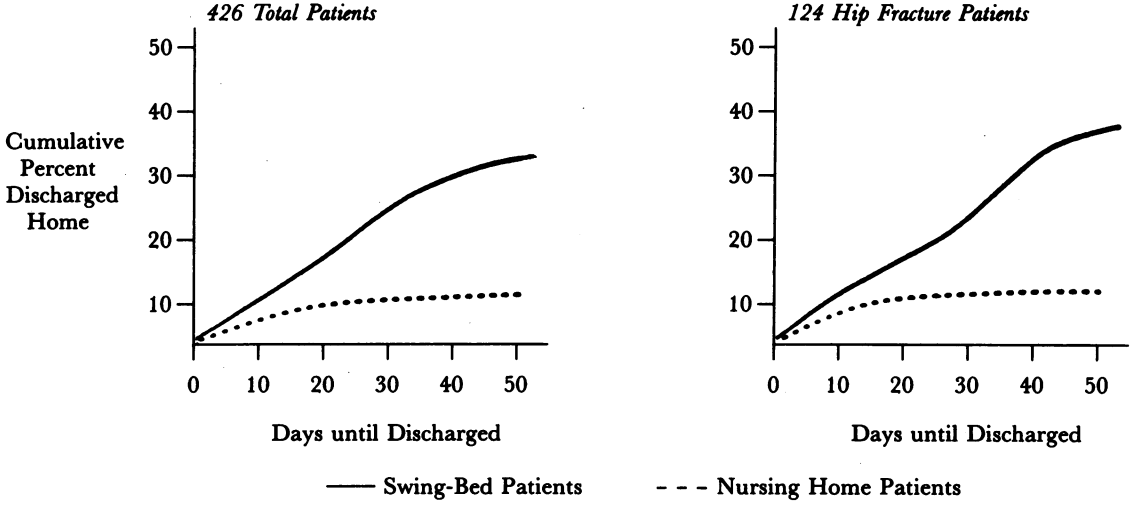
The survival curves presented in Figure 2 are illustrative of the results on testing whether the cumulative proportion of patients discharged home, as a function of time since admission, differed between swing-bed and nursing home patients.

The two graphs on the left-hand side pertain to all patients from

Figure 2: Swing-Bed and Nursing Home Patient Length of Stay until Discharge Home

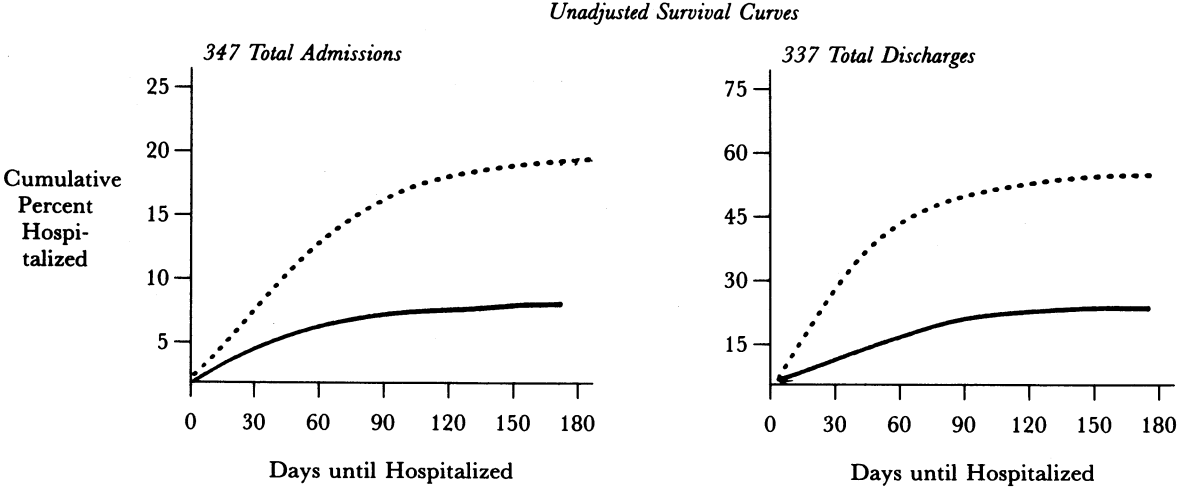


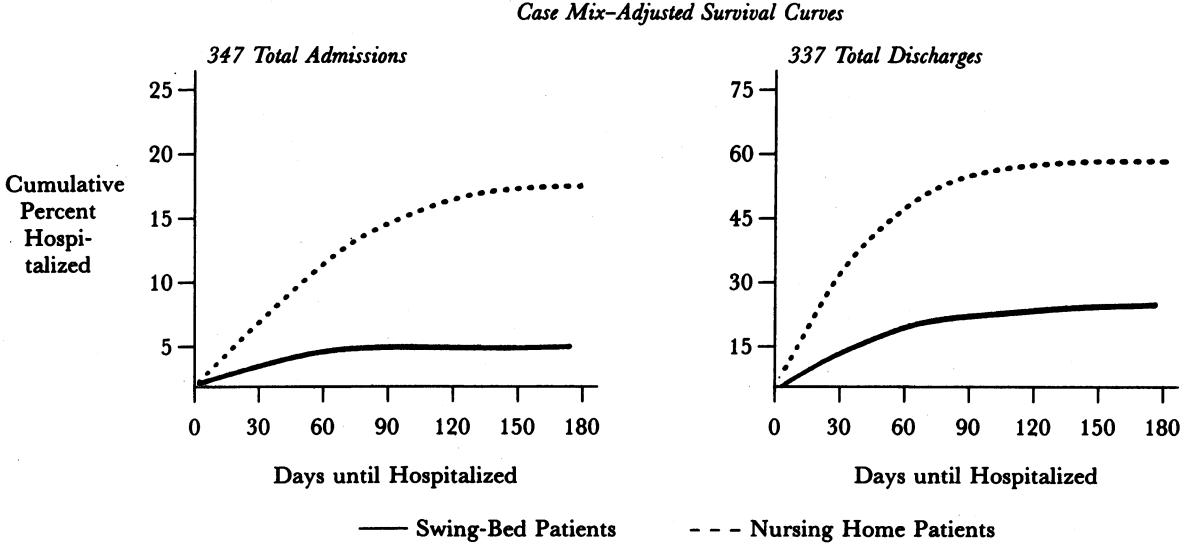
Case Mix–Adjusted Survival Curves



Based on 211 swing-bed and 215 nursing home patients in the in-facility stratified sample. All pairs of curves presented here are significantly different for $p < .001$. Patients discharged due to death were excluded from these analyses.

Figure 3: Swing-Bed and Nursing Home Patient Days until Hospitalization





Based on 142 swing-bed and 205 nursing home patients in the longitudinal admission stratified sample, and on 142 swing-bed patients and 195 nursing home patients in the longitudinal discharge sample. All pairs of curves presented here are significantly different at $p < .001$. Patients discharged due to death were included in these analyses with a mortality indicator used as a covariate for case-mix adjustment.

the four cohorts combined (i.e., confusion, incontinence, stroke, and hip fracture) for the six-week admission sample, exclusive of patients who died. The two on the right pertain only to hip fracture patients, exclusive of deaths. The unadjusted survival curves show that swing-bed hospitals generally tended to discharge patients home more frequently than nursing homes. This pattern is evident for the total sample and for hip fracture patients separately. The two lower sets of curves in Figure 2 show that although the distance between the original curves lessened, even after adjusting for case-mix differences the cumulative proportion of patients discharged home (as a function of time) is significantly greater ($p < .001$) for swing-bed patients than for nursing home patients. The same results persisted for the confusion, incontinence, and stroke cohorts. Covariates used to adjust survival curves for discharge home included not only case-mix variables, but also the home support system.

The survival curves in Figure 3 pertain to the cumulative percentage of patients hospitalized, for all patients in the six-month admission sample (the two survival curves on the left) and for all patients in the discharge random sample (the two curves on the right). The survival curves for the patients in the admission sample therefore pertain to the first episode of hospitalization that could occur any time within six months of admission, either while the patient was in the facility or after discharge. The survival curves for the discharge sample pertain to the first episode of hospitalization that could occur either at time of discharge *or* at any point within six months after discharge. Case-mix adjustments slightly increased the distance between the curves on the left and had little effect on the distance between the curves on the right. Hence, it appears that nursing home patients tend to be hospitalized more frequently than swing-bed patients within six months of admission, and at or within six months of discharge, taking case-mix differences into consideration.

PROCESS AND STRUCTURAL QUALITY FINDINGS

An evaluation of the swing-bed demonstration programs in the late 1970s included a component that examined process measures of quality for swing-bed hospitals and nursing homes (Shaughnessy et al. 1980; Shaughnessy, Breed, and Landes 1982). Process quality scores were computed by comparing the frequency and provider of each service with preset standards for such services (Shaughnessy, Breed, and Landes 1982). In all, the quality of care provided in swing-bed hospitals was

somewhat lower than the quality of care provided in the comparison nursing homes. The average nursing home quality score was 68.4 percent and the average hospital quality score was 64.0 percent of a maximum possible score of 100 percent. The results suggested that nursing homes provided higher-quality services in treating more traditional and chronic care needs, such as urinary incontinence, problems of primary skin condition, depression, loneliness, isolation, and lack of socialization.

In the national evaluation documented here, data were collected on 27 separate long-term care services for each patient in the six-week admission sample. The intent of the process quality assessment was to determine whether the difference between swing-bed hospitals and nursing homes in terms of treating chronic care patients still persisted. The 27 services included services more typically provided in traditional long-term care settings (e.g., bladder training, assistance with dressing and grooming), as well as a few services that, although available and provided in nursing homes, might be more likely to characterize services needed for near-acute long-term care patients (e.g., physical therapy, pain control).

Process quality scores were calculated using an approach similar to that employed previously (Shaughnessy et al. 1980). Services were identified and operationalized with the help of clinical panels consisting of multidisciplinary groups of experts in the long-term care field, including registered nurses, physicians, physical therapists, social workers, and other researchers and practitioners. Numeric weights characterizing the appropriateness and the importance of individual services for specific problem cohorts were developed. Individual quality scores were computed for each service and aggregated to the individual problem level, both on a service-specific basis and for groups of services. The effects of case-mix differences between swing-bed hospitals and nursing homes were first assessed by virtue of stratification into various cohorts (e.g., confused patients). Thereafter, case mix–adjustment analyses involving logistic regression and ordinary regression were also used.

After adjusting for case mix, the process quality results suggest that swing-bed hospitals provide somewhat higher-quality services in the areas of more "near-acute" ADL and nursing services (e.g., control of pain, range of motion, bathing, eating, and walking). However, nursing homes were characterized by higher case mix–adjusted average quality scores in the areas of traditional ADL and nursing services (e.g., dressing, assistance with elimination, preventive skin care, repositioning, and social/recreational activities). The results tended to be consistent with the earlier demonstration results, suggesting that "chronic care" services provided to more chronically ill or traditional

nursing home patients in swing beds were less adequate than analogous care provided in nursing homes.

Table 4 contains service-use profiles for selected services provided to a cross-sectional sample of long-term care patients in swing-bed hospitals and nursing homes. The almost tenfold greater frequency of physician visits in swing-bed hospitals reflects both the greater accessibility of physicians in such facilities and the near-acute composition of swing-bed case mix relative to community nursing home case mix. The profile of diagnostic services, intravenous medications, and intravenous fluids reflects the stronger rehabilitation orientation and near-acute case mix found in swing-bed hospitals.

With respect to structural indicators of quality, swing-bed hospitals and nursing homes were compared in terms of compliance rates with Medicare SNF conditions of participation; availability of ancillary services; nursing, social work and support-staff capacity, and physician availability. Compliance rates for conditions of participation were about the same for nursing homes and swing-bed hospitals. The analyses of ancillary service; nursing, social work, and support staff; and physician availability and visits generally pointed to a greater capacity to serve near-acute care needs on the part of swing-bed hospitals and a greater capacity to serve chronic care needs on the part of nursing homes (Shaughnessy, Schlenker, et al. 1987).

DISCUSSION

QUALITY MEASUREMENT AND ANALYSIS

With respect to methodology, this study examined numerous dimensions of long-term care quality: patient status outcomes, utilization outcomes, process measures, and structural measures of quality. The most significant results involve change in functioning and outcomes for certain types of long-term care problems. We also attempted to examine selected social, emotional, and cognitive attributes of nursing home and swing-bed patients over time, although we met with limited success in these domains because of lower reliability of these measures. Such dimensions of patient status are important in assessing outcomes for traditional long-term care patients more so than acute care or relatively short-stay patients. Additional measurement work is clearly needed here.

A natural complementarity exists among patient status outcomes, utilization outcomes, and process indicators of quality, and it is prefer-

Table 4: Selected Service Use Profiles for Long-Term Care Patients in Swing-Bed Hospitals and Nursing Homes, 1984 and 1985*

Services per Patient in Past Week	*Mean for Swing-Bed Hospital Patients*†	*Mean for Nursing Home Patients*†
No. physician visits	2.8	0.3
No. laboratory tests	1.4	0.3
No. x-rays	0.2	0.0
% therapeutic antibiotics for urinary tract infection	5.3	1.5
% intravenous fluids	3.6	0.6
% intravenous medications	4.7	0.0

*Based on a sample of 552 patients in 33 swing-bed hospitals and 540 patients in 40 nursing homes.

†Mean differences are significant at $p < .001$.

able to examine all three types of quality indicators concurrently. The utility of process measures in the context of examining outcome indicators rests with their potential to explain why certain outcome differences are observed. For example, the greater frequency of physician visits to patients in swing-bed hospitals is in all likelihood a factor that partly explains several of the observed outcome differences. Analogously, the greater emphasis on and quality of near-acute nursing services further explains the outcome findings.

Since health care is directed toward change in patient status, patient transitions from one state of health to another usually constitute the criterion by which individual providers of care gauge the efficacy of their care, deciding to retain or alter the care regimen on the basis of such transitions. For some conditions (e.g., diastolic blood pressure possibly indicating hypertension, certain types of impairments in functioning, and changes in mental status), however, the *pattern* of stability of change is also important to assess in determining the care regimen and environment. In analyzing many types of patient status outcomes it is therefore appropriate to examine outcome measures that reflect not only the change between two time points or the length of time until change occurs, but also the pattern of stabilization of change across several time points.

It is not always possible to examine as many dimensions of quality as was done in this study. Nonetheless, findings or observations about the quality of care should be qualified when one of these types of indicators is absent, especially when crude but highly sentinel and

controversial indicators (such as mortality rates) are used. At a minimum, some form of reality testing of results (e.g., obtaining reactions to study results from knowledgeable providers of care) can help to cross-validate findings, informally, through expert opinion. In this study, the findings were cross-validated by site visits, patient care observations, and discussions with physicians and nurses experienced in these settings. These visits, observations, and communications strongly suggested that patients in swing-bed hospitals would improve in functioning more than patients in nursing homes even if further risk-factor adjustments were made. For example, nearly all (96 percent) of the 23 physicians contacted after the study said that the study findings reflected their own observations of the differences between the quality of swing-bed care and that of nursing home care. Among the 60 nurses contacted, 100 percent of those from swing-bed hospitals and 73 percent of those from nursing homes also said the study findings agreed with their observations. The difference between the two groups of nurses may be attributable to a perception that the findings favored swing-bed hospitals over nursing homes, despite the fact that traditional long-term care for patients with chronic care needs is very likely better provided in nursing homes. The physicians' agreement with the findings probably represents a more balanced reaction, because physicians provide care to both nursing home and swing-bed patients and tend to be more familiar with patients' outcomes after discharge.

HEALTH POLICY IMPLICATIONS

This study found the quality of care for swing-bed patients to differ in a number of ways from the quality of care for nursing home patients. Most importantly, outcomes of care are different for the two patient groups. Even after adjusting for case-mix differences, patients cared for in swing-bed hospitals tended to improve and stabilize more rapidly than nursing home patients, especially in several ADLs and IADLs. Compared to similar nursing home patients (after case-mix adjustment), swing-bed patients were discharged home more frequently, hospitalized less frequently, and rehabilitated more quickly. Some of these differences in outcomes are attributable to the apparently different philosophies of the two settings. The typical community nursing home patient often has little hope of improving, requiring functional assistance daily. Therefore, nursing home staff provide ADL and other chronic care services more frequently—and probably more capably—than hospital staff, as the nursing home staff's higher process quality scores for these services indicate. It is possible, however, that such

services may be overprovided, at least to some nursing home patients who would become more independent if so encouraged. Some evidence that this occurs was found in another study (Shaughnessy, Schlenker, and Polesovsky 1986).

Hospital staff, on the other hand, routinely provide such services less frequently, encouraging the patient to be more independent, under the expectation that the patients will be rehabilitated and discharged home. Although this lack of chronic care service provision may be detrimental to chronically ill swing-bed patients ultimately discharged to nursing homes, it appears effective for patients with at least some rehabilitation potential and, possibly, for patients whose rehabilitation potential is unknown but who would benefit from the expectation that they will improve. Thus, swing-bed hospitals' greater emphasis on rehabilitation and greater frequency of physician visits appear to translate into greater medical and therapeutic attentiveness that, in turn, results in better rehabilitation outcomes and earlier discharge for swing-bed patients.

The swing-bed approach has gradually come to fill community gaps, especially in the areas of near-acute and "short-term long-term care." If swing beds were not available in rural communities, these near-acute patients would be discharged to (usually more distant) nursing homes that, in many instances, would not be able to provide as well for their relatively intense medical needs and would be more costly to payers. In general, the presence of swing beds in rural hospitals allows for significantly enhanced continuity of care, from acute care through less intense skilled nursing and medical care, possibly including rehabilitation, with eventual discharge home or to a community nursing home depending on the patient's condition. By providing a few days or weeks of additional care in swing beds, hospitals help some types of patients avoid being admitted to nursing homes, a psychologically difficult prospect for many elderly people. The case mix–adjusted findings on patient outcomes in this study suggest that even patients with rehabilitation potential are likely to remain longer (possibly permanently) in traditional nursing homes where rehabilitation care is not likely to be as adequate.

From a policy perspective, these findings have two significant implications. First, we should continue swing-bed care for patients with rehabilitation potential in rural communities and, perhaps equally important, experiment with the swing-bed approach in urban hospitals. Currently, a number of urban hospitals throughout the country are encountering significant difficulties in placing swing-bed-like patients in urban nursing homes. Postacute patients (whose acute care

stays are now considerably shorter than was the case prior to Medicare reimbursement based on DRGs) are difficult to place in many metropolitan nursing homes because of their medically intense needs, often accompanied by the need for continual monitoring by skilled nurses. Such patients are undesirable from the perspective of many certified nursing homes concerned either that these patients are too costly or that the nursing home staffing capacity is not adequate to care for such patients appropriately.

No acceptable reimbursement mechanism exists for caring for near-acute long-term care patients in urban hospital beds. They are in fact long-term care patients, not acute care patients, and therefore their long-term care stay should not be considered part of their acute care stay nor ultimately as care covered through the outlier payment mechanism under DRGs. Most such patients do not qualify for the intense rehabilitation care required in prospective payment–exempt rehabilitation hospital beds. The conversion of hospital beds to SNF beds is not possible in many states owing to certificate-of-need laws and moratoria on nursing home beds. Further, the swing-bed reimbursement mechanism is less costly to Medicare than SNF reimbursement, currently saving Medicare about $5 million a year on SNF care in rural communities (Shaughnessy et al. 1987). Thus, a swing-bed approach in urban hospitals is likely to benefit patients and to result in cost-effective care from the perspective of the Medicare program.

The second major policy implication of this study derives from the differences between the rehabilitation care versus maintenance care philosophies for long-term patients mentioned earlier. For patients who can and should be rehabilitated to return to a more independent living environment, the orientation of the patient care staff and the total living environment is critical. If a patient who should be encouraged to function independently is cared for by a nurse's aide trained and experienced in maintenance care (i.e., patient feeding, bathing, dressing, etc.), it is not as likely that the patient will return to independent functioning than if he or she were cared for by an individual trained and experienced in encouraging independence. While most nursing homes do not deliberately mix patients who require rehabilitation care with those who require exclusively maintenance care, it is not unusual for this to happen, especially in facilities that have relatively few SNF patients or patients with rehabilitation care needs. Even if such patients are physically separate from those requiring maintenance care, it is understandably difficult for staff to make the transition from an almost dependency-fostering philosophy of care for patients who

need largely maintenance care to an independence-fostering philosophy of care for patients who require such care.

The broad categories of skilled nursing facility care and intermediate care facility care in the United States are simply not adequate. Greater attentiveness must be given to assessing the rehabilitation potential of patients judged to have such potential, and placing such patients in a care environment that is dedicated to therapeutic and rehabilitation care to the extent possible. We must put aside the attitude that a nursing home is the institution of last resort. In fact, the wide array of different types of care that must be provided in nursing homes, as a function of patient needs, is considerable. We must scrutinize how we pay for and assure the quality of nursing home care, not solely as a function of past and existing nursing home practices and customs, but as a function of the care needs of individual residents and patients. Taken in this context, hospital-based nursing homes and an even more cost-effective alternative, hospital swing beds, have a great deal to offer in providing short-term long-term care. This is not to say that freestanding nursing homes, especially those that currently care for high proportions of Medicare patients, cannot provide high quality near-acute care. In fact, freestanding nursing homes should be encouraged not only to continue to provide maintenance care for long-stay residents but also (and a number of the better facilities are currently doing this) to be more attentive to the difference between rehabilitation and maintenance care for individual patients in all aspects of their care programs.

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