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A Comparison of Skilled Nursing Facility Rehabilitation Treatment and Outcomes Under Medicare Managed Care and Medicare Fee-for-Service Reimbursement

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Purpose: This article compares the rehabilitation treatment and outcomes of Medicare managed care organization (MCO) and fee-for-service (FFS) patients in skilled nursing facilities (SNFs). ***Design and Methods:*** Data on 514 MCO patients and 420 FFS patients treated in four for-profit Southern California-based SNFs between June 1996 and September 1998 were analyzed with bivariate and multivariate regression models. ***Results:*** After controlling for time since onset and other sociodemographic and health status characteristics, Medicare MCO patients were found to receive significantly fewer therapy units and have significantly shorter lengths of stay in rehabilitation programs. ***Implications:*** The findings may be the result of more global differences in the trajectories of care among MCO and FFS patients treated in SNFs, yet they highlight critical issues related to the spread of Medicare managed care in nursing homes and the dynamic between MCO and FFS reimbursement systems.

Key Words: Health outcomes, Managed care, Postacute care

The rapid growth of Medicare managed care enrollment is impacting the structure of postacute health care for older Americans (Mor, 1998). Yet, because most studies of managed care have focused on acute care, there is a dearth of information on how changes in payment structure affect postacute and long-term care treatment and outcomes (Binstock & Spector, 1997; Friedland & Feder, 1998; Zinn, Mor, Castle, Intrator, & Brannon, 1999). As Fraser (1997) notes, structural changes, common in health services, create an array of natural experiments available for researchers to compare the effectiveness of different approaches. The provision of rehabilitation services to Medicare managed care organization (MCO) and Medicare fee-for-service (FFS) patients in skilled nursing facilities (SNFs) represents the framework for a natural experiment.

Managed care contractual arrangements for rehabilitation services are very different from Medicare FFS reimbursement. Managed care utilization review mechanisms closely monitor the course of rehabilitation and services and are usually discontinued if improvement is not demonstrated. MCO contracts detail levels of care parameters for reimbursement that limit per day and total units of therapy offered to managed care enrollees. The evolution of SNF-based rehabilitation services over the last decade also has included more risk-bearing physician involvement in the postacute treatment process. This trend is widespread in California, where Medicare managed care penetration is near 50% in some counties and where financial risk began shifting from the health plan to the physician group level in the mid-1990s (Robinson & Casalino, 1995). The assumption of risk on the part of physician groups or individual physicians is an important determinant of health care utilization (Landon, Wilson, & Clear, 1998).

In Medicare FFS reimbursement, an SNF patient qualifies for therapy on what the Health Care Financing Administration (HCFA) terms a "medically necessary" basis, which assumes that the patient is served at the "most appropriate" level of care. Under this form of payment, the provision of services is subject to retrospective utilization review from fiscal intermediaries. The financial incentives of the Medicare FFS reimbursement system in existence prior to the Balanced Budget Act of 1997 (1997BBA) rewarded nursing homes for providing rehabilitation therapies to patients. As a result, SNFs providing rehabilitation services to both Medicare MCO and Medicare FFS patients operated under markedly different incentive systems.

Under the current nursing home Medicare prospective payment system (PPS) that began for most facilities on January 1, 1999, as part of the 1997BBA, patients receiving rehabilitation services are categorized in the highest reimbursement Resource Utilization Groups (RUG-III). Providing rehabilitation to patients continues to be financially rewarding for most

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facilities because of the higher per diem reimbursement rates associated with rehabilitation RUG classes (Office of the Inspector General, 1999). Efforts to evaluate the impact of PPS will need to take into account the scope of SNF rehabilitation provision prior to PPS. The specific effects of PPS on facilities engaged in extensive managed care contracting will be a particularly compelling issue given their previous experience with per diem reimbursement tied to levels of care. The question in terms of policy and practice is whether the pre-PPS Medicare FFS reimbursement system and the Medicare MCO reimbursement system were applied to similar groups of patients and whether the different incentives were translated into observable differences in rehabilitation treatments and outcomes.

Patient-centered research on the comparative effectiveness of MCO and FFS methods in serving vulnerable populations is mixed. While some studies suggest that vulnerable populations have poorer outcomes under managed care (Clement, Retchin, Brown, & Stegall, 1994; Ware, Bayliss, Rogers, Kosinski, & Tarlov, 1996), others do not (Greenfield, Rogers, Mangotich, Carney, & Tarlov, 1995; Retchin & Brown, 1991). As most of these studies have focused on acute care, significant gaps remain in the literature on the role that payment structure plays in determining how efficiently and effectively postacute care is delivered in nursing homes (Von Korff, Gruman, Schaefer, Curry, & Wagner, 1997; Wiener & Scaggs, 1995). Thus, the goal of this study was to compare MCO and FFS patients in SNF physical therapy (PT) and occupational therapy (OT) on characteristics at admission, treatment, and outcomes (discharge).

Admission

When comparing treatments and outcomes between MCO and FFS patients admitted to SNFs, it is important to recognize and, to the extent possible, address the potential effects of selection bias. Several sources of bias may occur including differences in disease severity, general health, and/or treatment prior to admission into the SNF. For example, several studies suggest that MCOs enroll healthier patients than those who remain in Medicare FFS (Brown, Bergeron, Clement, Hill, & Retchin, 1993; Counte & Glandon, 1996). In addition, there is some evidence that Medicare MCO enrollees use fewer inpatient services than FFS beneficiaries prior to enrollment and that those who disenroll have comparatively higher rates of inpatient service use after disenrollment (Morgan, Virnig, DeVito, & Persily, 1997). Anecdotal evidence from providers regarding disenrollment suggests that providers may encourage patients to change to FFS if extensive treatment needs are anticipated.

Other sources of potential bias include utilization decisions made at earlier points in patients' episodes of care. Managed care organizations contain costs by limiting the acute hospital stays of patients and by placing stabilized patients in less expensive SNF-based rehabilitation programs (Retchin, Brown, Yeh, Chu, & Moreno, 1997). Also, FFS patients may be transferred to a hospital-based transitional care unit following their acute admission to allow the hospital to collect both the diagnostic-related group (DRG) and hospital-based SNF reimbursement (Kane et al., 1996). Thus, FFS patients who are eventually admitted to a freestanding SNF are potentially different from their MCO counterparts in terms of length of hospital stay and exposure to some rehabilitation care prior to admission. Because response to rehabilitation is not linear, FFS and MCO patient groups may be at different points in their recovery trajectories when entering into SNF-based rehabilitation.

We attempt to account for differences in recovery trajectory by comparing MCO and FFS patients on the variable Time Since Onset (computed using the date of hospital admission) and then stratifying according to this variable for subsequent bivariate baseline comparisons. We hypothesize that the two groups will differ in Time Since Onset, yet not differ in demographic characteristics or health status measures after stratification.

Finally, although randomization is the best approach to address selection bias, randomization is generally not possible in field studies comparing MCO and FFS patients. Instead, multivariate statistical methods offer a means to reduce biases introduced at baseline by controlling for factors that may influence levels of treatment and outcomes. Such factors include demographic variables as well as measures of health status, diagnosis, and comorbidity. We attempt to account for potential differences at baseline by conducting multivariate analyses.

Treatment

The utilization review mechanism that MCOs employ to monitor the effectiveness of rehabilitation services and the levels of care parameters in managed care contractual agreements operate to constrain therapy utilization. We hypothesize that, controlling for Time Since Onset and other treatment and sociodemographic characteristics, MCO patients have significantly shorter lengths of stay in SNF-based rehabilitation programs, receive significantly fewer units of rehabilitation per day, and consequently receive significantly fewer total units of rehabilitation.

Discharge

Health plans holding the financial risk associated with caring for Medicare MCO patients have a financial incentive to reduce costly rehospitalizations. Health plans also are more likely to arrange for less costly home health care when a patient's health status permits it. Thus, we expect that, compared to Medicare FFS, MCO patients are less likely to be rehospitalized and more likely to be discharged home directly from rehabilitation, controlling for Time Since Onset. The extent to which less treatment and earlier discharge affects functioning is unknown. Therefore, after stratifying by Time Since Onset, we

compare functioning at discharge without hypothesizing about the direction of difference. Multivariate analyses to examine the independent effects of payment source on functional status at discharge were not conducted due to the relatively small numbers of patients within each functional deficit area.

Methods

Sample

The data set consists of 934 rehabilitation patients age 65 and over who were admitted for the first time, treated and discharged between June 1, 1996, and September 30, 1998, in one of four for-profit SNFs. The facilities were owned by a midsize (12 facilities) postacute care provider operating in Southern California, a mature managed care market (Zelman & Berenson, 1998) with high penetration of Medicare managed care (43.9% in June 1998). Unlike other geographic regions where managed care options under Medicare are relatively new, many Medicare recipients have been served under managed care for a relatively long period of time—in essence, aging within their health plans.

The strategy of using one nursing home organization was a means of controlling for provider variation in approaches to management, therapy, and data collection. We selected this provider for several reasons. First, the provider organization had a strong track record and a good reputation for quality rehabilitation. Second, it contracted with major health plans in both fee-for-service and managed care. Third, the chain was a midsized family-owned organization whose owners were committed to preserving the existing structure. This ownership structure sheltered the organization from the dynamics of mergers and acquisitions that have characterized relationships among publicly traded SNFs for the last several years. The hyper-turbulent environment of changing ownership and management has introduced a major confound into research in health and long-term care.

The four SNFs participating in the study were all accredited by the Joint Commission for Health Care Organizations (JCAHO). The four SNFs were the only facilities in the chain to collect detailed therapy outcome data over an extended period of time for the same therapy vendor. Data elements were drawn from facility census records, billing, and therapy vendor outcome files merged together for purposes of this study. Procedures for reporting the data were similar across all sites and across payment source groups.

The sample of Medicare MCO (n = 514) and FFS (n = 420) therapy patients was derived from a population of 2,191 total MCO and FFS first-time admissions during the period. In applying our selection criteria of 65 years of age or older, Medicare eligible and recipients of physical and/or occupational therapy, we screened out 459 patients who were under age 65 and 798 who did not receive either physical or occupational therapy. The Medicare MCO patients belonged to one of eight different managed care organizations, ranging from a staff model HMO to a risk-assuming physician–hospital organization (PHO) to a risk-assuming physician group. All the managed care contracts outlined services in a per diem level of care arrangement. The agreements established levels of care that ranged from providing no therapy services to 60 to 180 minutes per day of physical, occupational, and/or speech therapy. Because too few patients received speech therapy to make meaningful comparisons, we focused only on those who received PT and/or OT.

Measures

Characteristics at Admission.—Pretreatment health care utilization was measured using Admission Source (hospital vs other) and Time Since Onset variables. Time Since Onset was calculated from the date of admission into the hospital and the date of admission into each of the rehabilitation programs. Demographic measures included age, sex, and marital status.

Functional status was measured using the Rehabilitation Outcome Measure (ROM). The ROM was designed by the rehabilitation provider's therapists to rate postacute patients on their level of function for discipline-specific deficit areas (South Coast Rehabilitation Services, 1994). An updated version of the ROM is in use in more than 400 facilities nationwide as part of a JCAHO-accredited ORYX performance measurement system. The ORYX system is part of the new JCAHO accreditation process designed to generate objective, quantifiable information about health provider performance to be used externally to demonstrate accountability.

Therapists completed ROM assessments at admission and discharge from therapy on deficit scales ranging from 0 (dependent) to 6 (independent). The PT program concentrated assessments in the transfers, gait-level surfaces, and bed mobility deficit areas, whereas the most frequent deficit areas in the OT program were bathing, dressing, and grooming. Ordinal qualities of the ROM deficit areas prohibit the generation of additive summary scores for each therapy program and make a comparison of means scores within each deficit area problematic. Thus, nonparametric tests were employed to examine differences in the distribution of ROM deficit area scores between MCO and FFS patients at admission.

Patients were classified into diagnostic categories using ICD-9 codes assigned by the rehabilitation programs. Because of the wide range of primary diagnoses, it was not possible to generate diagnosis-specific results beyond controlling for hip or stroke diagnosis (the two largest diagnosis groups) in the multivariate analysis. However, from zero to five secondary conditions (ICD-9 codes) were listed in the provider's information system from which Deyo-Charlson Comorbidity Index scores were computed (Charlson, Pompei, Ales, & MacKenzie, 1987; Deyo, Cherkin, & Ciol, 1992).

Characteristics of Treatment.—Length of rehabilitation therapy stay in PT and OT, units of service per day, total units of therapy received, and payment

source were included as characteristics of treatment. Therapists provided one to eight units of therapy per day (one unit is 15 minutes of therapy).

Characteristics at Discharge.—Discharge destination from the rehabilitation program included the following options: discharged to a hospital, to home, to an assisted living facility, to skilled nursing with improved status, to skilled nursing with same status, to custodial care within the facility, or died while in the rehabilitation program. The nonparametric Mann-Whitney U test was employed to examine differences in the distribution of ROM deficit area change scores.

Results

Characteristics at Admission

Pretreatment Health Care Utilization.—There were no statistically significant differences in source of admission; 92.1% of MCO patients and 93.8% of FFS patients were admitted from a hospital. Nevertheless, Medicare MCO patients admitted from a hospital averaged significantly fewer days in the period between admission into the hospital and admission into PT and OT. For PT, the average time since onset was 6.2 days (SD = 8.1) for MCO patients compared to 15.5 days (SD = 14.0) for FFS patients. For OT, the average time since onset was 10.2 days (SD = 10.1) for MCO patients compared to 19.2 days (SD = 21.3) for FFS patients. To control for these disparities in subsequent analyses, Time Since Onset was used to stratify patients into two groups: the short hospital stay group with 5 or fewer days since admission to a hospital, versus the longer hospital stay group with 6 or greater days since admission to a hospital. Clinical experience suggests 1 to 5 days define short-stay acute hospital episodes. The results described below pertain to only those patients admitted from a hospital (473 MCO patients and 394 FFS patients).

Demographics.—MCO and FFS patients who received physical therapy services within 5 days of their episode onset were largely similar in their demographic composition. Table 1 reveals that there were no significant differences in sex or marital status, but Medicare FFS patients admitted into physical therapy within 5 days of onset (n = 146) were on average slightly older (81.7 years) than Medicare MCO patients (n = 282, 79.9 years; $p < .05$). The differences between FFS patients (n = 245) and MCO patients (n = 179) admitted into physical therapy more than 5 days after onset were more pronounced. Medicare FFS patients were more likely to be unmarried (74.1%), female (64.5%), and older (81.2 years). Similar differences in sociodemographic characteristics were observed for patients admitted into occupational therapy more than 5 days after onset.

Comorbidity.—As shown in Table 1, there were no significant differences in the Deyo-Charlson Comorbidity Index scores for the two payment source groups, with mean scores for both groups clustered around 1.0.

Functional Status.—The Mann-Whitney U statistic was calculated for each deficit area to test for differences in the location of the score distribution between the two payment source groups. There were no significant differences between the two payment source groups in ROM deficit area scores at admission after stratifying by time since onset. Table 2 contains the distribution of mean ROM scores prior to

Table 1. Medicare Managed Care and Medicare Fee-for-Service Characteristics by Therapy Program, Stratified by Time Since Onset

	Physical Therapy				Occupational Therapy			
	≤5 Days Since Onset		≥6 Days Since Onset		≤5 Days Since Onset		≥6 Days Since Onset	
	MCO n = 282	FFS n = 146	MCO n = 179	FFS n = 236	MCO n = 88	FFS n = 65	MCO n = 114	FFS n = 210
Characteristics at Admission								
Average age	79.9 (8.2)*	81.7 (8.4)	78.4 (7.4)***	81.2 (7.6)	80.4 (8.3)	81.2 (9.4)	79.2 (7.4)***	82.1 (7.9)
% Female	59.1%	59.3%	54.4%*	64.5%	58.8%	62.0%	56.8%*	68.2%
% Unmarried	65.5%	74.8%	60.8%*	74.1%	66.1%	74.3%	63.5%*	76.6
Average Deyo-Charlson Comorbidity Index score	0.8 (1.1)	1.0 (1.1)	1.1 (1.2)	1.3 (1.1)	0.9 (1.0)	1.0 (1.0)	1.0 (1.2)	1.1 (1.2)
Characteristics of Treatment								
Average length of stay	9.1 (7.2)*	13.1 (13.4)	12.7 (10.2)***	18.3 (18.1)	7.1 (3.9)*	12.1 (11.1)	8.1 (7.2)***	15.8(11.5)
Average therapy units per day	4.3 (1.3)*	6.1 (6.0)	4.0 (1.5)***	5.9 (1.8)	2.2 (0.9)***	5.6 (2.5)	2.3 (0.9)***	5.7 (1.5)
Average total therapy units	44.9 (30.3)***	71.2 (81.2)	55.6 (60.8)***	112.3 (91.5)	15.1 (11.9)***	72.8 (73.3)	16.9 (14.3)***	98.3 (83.7)
Discharge Destination								
% Rehospitalized	9.5%***	17.8%	11.9%***	20.1%	8.7%	6.6%	11.3%	12.3%
% Home	73.3%***	55.1%	77.1%***	47.3%	56.2%***	33.9%	62.7%***	36.5%
% SNF improved functioning	1.1%	3.2%	0.3%	4.8%	13.1%***	25.4%	11.6%***	27.3%
% SNF same status	1.5%	3.1%	0.1%	3.5%	9.5%***	20.2%	4.9%***	12.3%
% Custodial	7.2%*	12.6%	4.3%*	14.4%	4.0%*	8.3%	1.8%*	5.6%
% Assisted living	4.9%	3.2%	4.1%	4.7%	6.4%	4.4%	6.1%	4.4%
% Died	2.5%	5.0%	2.2%	5.2%	3.0%	1.2%	1.6%	1.6%

*$p < .05$; ***$p < .001$; χ^2 statistic for categorical variables, t test for continuous variables.

Table 2. Rehabilitation Outcome Measure (ROM) Scores at Admission and Discharge by Payment Source[a]

	Admission				Discharge			
	Managed Care		Fee-for-Service		Managed Care		Fee-for-Service	
ROM Deficit Area[b]	*n*	Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SD*)
Physical Therapy								
Bed mobility	398	1.90 (1.04)	323	1.83 (1.12)	395	2.34 (1.81)	321	2.35 (1.51)
Transfers	405	1.83 (1.03)	361	1.79 (1.11)	398	2.42 (1.70)	355	2.35 (1.53)
Gait-level surfaces	365	2.04 (1.19)	289	1.78 (1.15)	364	2.65 (1.61)	283	2.32 (1.44)
Occupational Therapy								
Bathing	177	1.58 (0.82)	231	1.45 (0.93)	174	2.69 (1.22)	224	2.68 (1.12)
Dressing	163	1.51 (0.91)	159	1.48 (0.91)	160	2.99 (1.53)	159	3.11 (1.41)
Grooming/hygiene	130	2.46 (1.04)	144	2.31 (0.96)	126	3.81 (1.85)	143	3.84 (1.90)

[a]Means for the combined sample are included for descriptive purposes; Mann-Whitney tests were computed after stratifying by Time Since Onset to test whether the distributions of the FFS and MCO scores were equivalent in location at admission and to test if change scores derived from admission and discharge values differed in location. There were no significant differences.
[b]ROM score range: 0 = dependent, 6 = independent.

stratification to illustrate the range of scores within deficit areas.

Characteristics of Treatment

Length of Stay.—MCO enrollees had significantly shorter lengths of stay in the rehabilitation programs after stratifying by time since onset (Table 1). The average PT length of stay for short hospital stay MCO patients was 9.1 days (*SD* = 7.2), compared to 13.1 days (*SD* = 13.4) for FFS beneficiaries. The differences in PT lengths of stay persisted for the longer hospital stay patients (MCO = 12.7, SD = 10.2; FFS = 18.3, *SD* = 18.1). The average OT length of stay for short hospital stay MCO patients was 7.1 days (*SD* = 3.9), compared to 12.1 days for FFS patients (*SD* = 11.1). The differences were also present among the longer hospital stay patients (MCO = 8.1, *SD* = 7.2; FFS = 15.8, *SD* = 11.5).

Therapy Intensity.—MCO patients received significantly fewer therapy units per day, on average. Short hospital stay MCO PT patients received 4.3 units per day (*SD* = 1.3), compared to 6.1 per day (*SD* = 6.0) for FFS patients. Longer hospital stay MCO PT patients also averaged 4.0 units of PT per day (*SD* = 1.5), whereas FFS patients averaged 5.9 PT units per day (*SD* = 1.8). Significant differences in therapy units per day were likewise present in the OT program for both the short and longer hospital stay groups.

Total Therapy Units.—Given the large differences between MCO and FFS patients in length of stay and therapy units per day, it follows that MCO patients received significantly fewer total therapy units than FFS patients. Short hospital stay MCO patients received an average of 44.9 PT units (*SD* = 30.3) compared to 71.2 units (*SD* = 81.2) for FFS patients. The difference was more pronounced in the longer hospital stay groups, with MCO patients receiving an average of 55.6 PT units (*SD* = 60.8) and FFS patients receiving an average of 112.3 PT units (*SD* = 91.5). Similar patterns of differences were present in both the short and longer stay OT patients.

Multivariate analyses were conducted to test for the effects of payment source on levels of rehabilitation treatment while controlling for sociodemographic and initial health status characteristics. The effects of payment source on total PT units and total OT units are pronounced. Table 3 reveals that receiving care under a managed care contract is associated with a reduction of 42.8 total PT units, controlling for age, sex, marital status, time since onset, comorbidities, and whether the individual was a stroke or hip fracture patient. Medicare MCO status has a similar effect on receiving occupational therapy, decreasing total OT units by 72.2 units after controlling for the above characteristics.

Characteristics at Discharge

Discharge Destination.—Upon discharge from the PT program, 9.5% of short hospital stay MCO patients were rehospitalized compared to 17.8% of FFS patients. Conversely, 73.3% of short hospital stay MCO patients were discharged home compared to 55.1% of FFS patients. The differences were also evident in the longer hospital stay PT patient groups, where 11.9% of MCO patients were re-hospitalized compared to 20.1% of FFS patients and 77.1% of MCO patients were discharged home versus 47.3% of FFS patients. The noteworthy differences in OT discharge destination are the consistently higher percentages of FFS patients remaining in the SNF after discharge from OT. It appears as though MCO patients were more likely to be discharged from the facility at the point when OT therapy services were discontinued.

Functional Status.—There were no significant differences between the two payment source groups in ROM deficit area scores at discharge after stratifying by time since onset. Table 2 lists the nonstratified mean deficit area scores for each payment source group at discharge.

Table 3. Summary of OLS Regression Analysis for Variables Predicting Total Physical and Occupational Therapy Units Received

	Total Physical Therapy Units $n = 843$		Total Occupational Therapy Units $n = 477$	
Independent Variables	Beta	*t* Statistic	Beta	*t* Statistic
Married	–2.62	–0.37	10.40	1.02
Age (in years)	0.11	0.28	0.34	0.63
Dayo-Charlson Comorbidity Index	–1.62	–0.61	–1.01	–0.29
Hip fracture diagnosis	20.28*	2.07	–1.18	–0.09
Stroke diagnosis	17.88	1.88	–2.70	–0.23
Time since onset (in days)	1.37***	4.86	0.95*	2.52
Medicare managed care enrollee	–42.89***	–6.68	–72.21***	–7.87
Intercept	66.93	2.05	52.12	1.14
R^2	.18		.29	
Adjusted R^2	.17		.27	

*$p < .05$; ***$p < .001$.

Discussion

This study utilized a natural experiment within the skilled nursing setting to compare admission, treatment, and discharge differences between patients in rehabilitation under managed care and fee-for-service reimbursement. The purpose of the study was to examine the relationship between payer source and rehabilitation treatment and outcomes. Although a number of studies have been conducted comparing MCO and FFS on treatment and outcomes, little attention has been devoted to postacute care.

Several new and important findings emerged from this study. At admission, FFS patients had, on average, experienced longer lengths of stay in the hospital. After stratifying the sample by hospital length of stay into short-stay and long-stay groups, the short-stay group differed only in that FFS patients who received PT were slightly older than MCO enrollees. Sociodemographic differences between long-stay subjects were more pronounced. Longer hospital stay FFS patients were more likely to be female and less likely to be married than were MCO patients. No differences were found in either group in functioning or in number of comorbidities.

Substantial differences were found in both the length and intensity of physical and occupational therapy, with MCO patients receiving significantly less treatment in all categories (short and long stay in both PT and OT). After controlling for baseline differences, FFS patients received, on average, nearly twice as much therapy as managed care patients. At discharge, FFS patients in all categories (long and short hospital stays, PT and OT) were more likely to be readmitted to the hospital and less likely to be discharged to home.

Although the large differences in rehabilitation treatment between Medicare MCO patients and Medicare FFS patients are unambiguous, there are several explanations for why MCO patients received significantly less therapy treatment, including:

1. MCO patients were on average healthier than FFS patients and thus needed less therapy;
2. The managed care organization effectively managed care by targeting treatment to those most likely to benefit;
3. SNF-based therapy services for MCO patients were discontinued in favor of home-based therapy provision;
4. Due to financial constraints or incentives, MCO patients received less than the optimal number of therapy units and/or FFS patients received more than the optimal number of therapy units.

The large differences in Time Since Onset may be an indicator that FFS patients were in worse health on average compared to MCO patients. The larger percentage of discharges home from rehabilitation among MCO patients coupled with the generally higher percentage of hospital readmissions among the FFS group could likewise be indicative of an FFS patient population in worse health. However, the fact that treatment differences persisted after stratifying by Time Since Onset while few demographic or functional status differences were evident suggests managed care targeting may have been effective for those Medicare MCO enrollees who received rehabilitation services. The results are likely due to some combination of poorer health status among FFS patients coupled with more appropriate targeting on the part of MCO plans.

Yet, it is difficult to speculate further about the overtreatment/undertreatment question in the absence of more complete analyses concerning the fate of patients who did not receive any therapy services as well as the fate of the large percentage of Medicare MCO patients who were discharged home. The findings raise a number of questions and suggest important areas for future research. Given indications of a sicker population in FFS, to what extent were subjects appropriately or inappropriately referred to therapy? Did MCO patients continue to receive needed therapy services at home? Were MCO patients more likely to be rehospitalized following their discharge home?

Recent studies based on random samples of community-dwelling adults age 65 and over in San Diego County, California, found that (a) Medicare MCO en-

rollees received 71% fewer home health visits than did FFS participants after controlling for health and sociodemographic characteristics (Experton, Li, Branch, Ozminkowski, Mellon-Lacey, 1997), and (b) the odds of preventable rehospitalization were 3.51 times as high for Medicare MCO enrollees compared to Medicare FFS participants (Experton, Ozminkowski, Pearlman, Li & Thompson, 1999). The results of the San Diego studies lend credence to the assertion that resource targeting practices of MCOs within the nursing home setting may have significant unintended consequences at later points along the continuum of care for those with poorer postacute prognoses.

The present study appears to illustrate how managed care financing targets the provision of rehabilitation services within the nursing home setting, yet it remains only a snapshot of a larger and more complicated health services continuum. It is a system made even more potentially fragmented with the passage of the 1997BBA provisions to reduce home health and nursing home postacute Medicare expenditures.

Until the introduction of nursing home PPS, most nursing homes had little experience with a payment system that departed from retrospective reimbursement for medically necessary care. Providers with prior experience in contracted per diem reimbursements for managed care patients may have an advantage during PPS implementation. However, it is also likely that cost shifting under the old FFS cost-based reimbursement system allowed providers to be more competitive in contracting with MCOs. One possibility is that managed care targeting practices appeared effective in isolation in the present study to some extent because of the limited marginal benefits resulting from the high level of rehabilitation therapy services provided to Medicare FFS patients. The refinements to the Medicare FFS payment system designed to reduce overutilization may adversely affect patients cared for under MCO contracts if PPS-related staffing and training changes limit opportunities for cost shifting. Evaluations of PPS should be broadened to investigate possible indirect effects of the policy. Provider data on SNF rehabilitation such as the data analyzed in this study will be valuable for such pre/post evaluation efforts.

The MCO patients in this study received care under several forms of managed care contracting. Studying the differences in treatment and outcomes *within* managed care arrangements remains a challenging yet necessary research focus to untangle the various ways in which capitated financing impacts health care utilization and patient outcomes (Wagner, 1997). The introduction of postacute hospitalist models of care in Southern California is an occurrence that will be particularly compelling to monitor within an ongoing natural experiment approach.

At this point we do not know how close we are or if we have exceeded the limits of cost reduction through shorter nursing home postacute stays and more targeted resources. Nor do we know how utilization review in one part of the delivery system explicitly affects other parts of the continuum of care. Future studies on this issue would benefit from joint efforts on the part of providers and payers to coordinate their management information systems so as to track individuals across the continuum of care and monitor health outcomes. There is need to explicitly track MCO and FFS patients from the nursing home to examine rates of rehospitalization and home care utilization. Until we are able to follow Medicare FFS and MCO enrollees across these settings, research on this issue is likely to continue to raise more questions than it answers in terms of the effects of reimbursement mechanisms on quality of care. Data integration at the patient-encounter level is critical, given the risks for the Medicare system and the vulnerable population that it serves.

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