The Effect of Evercare on Hospital Use

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OBJECTIVES: To examine the use of hospital and related medical care services of a novel managed care program using nurse practitioners (NPs) and directed specifically at long-stay nursing home residents.

DESIGN: Quasi-experimental posttest design with two control groups to minimize selection bias.

SETTING: Nursing homes.

PARTICIPANTS: Evercare enrollees in five sites were compared with two sets of controls: nursing home residents in the same nursing homes who did not enroll in Evercare (control-in) and residents of nursing homes that did not participate in Evercare (control-out).

MEASUREMENTS: Utilization data from Medicare and United Healthcare (the parent corporation for Evercare) were obtained for slightly more than 2 years. Patterns of use were assessed by calculating the monthly use rate for each group and aggregating to form annual rates. Usages addressed included hospital admissions and days, emergency room visits, therapy services, mental health services, and podiatry. Adjustments were made to correct for age, race, and sex. Because the groups differed in terms of the rate of cognitive impairment, the analysis was stratified on this variable.

RESULTS: The incidence of hospitalizations was twice as high in control residents as in Evercare residents (4.63 and 4.67 per 100 enrollees per month vs 2.43 in the 15 months after census, $P<.001$). This difference corresponded to Evercare's use of intensive service days. The same pattern held for preventable hospitalizations (0.80 and 0.86 vs 0.28, $P<.001$). The pattern held when residents were stratified by cognitive status. On average, using a NP is estimated to save about $103,000 a year in hospital costs per NP.

CONCLUSION: The use of active primary care provided by NPs may have prevented the occurrence of some hospitalizable events, but its major effect was allowing cases to be managed more cost-effectively. **J Am Geriatr Soc 51:1427–1434, 2003.**

Key words: managed care; nursing homes; nurse practitioners; Medicare

The Evercare program operated by United Health Care (UHC) represents a model that tests the effectiveness of primary health care in improving the outcomes of nursing home residents. Evercare is a for-profit variation of a Medicare+Choice health maintenance organization (HMO). They are paid a fixed capitated amount for each nursing home resident covered. In this instance, the program has been marketed exclusively to long-stay nursing home residents (postacute care recipients are avoided), but it covers only Medicare-related services. The capitated payment rate for nursing home residents is considerably higher than that for community-dwelling beneficiaries. The basic coverage for nursing home care beyond payment for skilled nursing days (and special arrangements for extra payments) is separate. The underlying premise of the program is that providing more intensive primary care will reduce the use of more expensive services such as hospitalizations. To achieve this higher level of primary care intensity, Evercare employs a cadre of nurse practitioners (NPs) who work in cooperation with the residents' primary care physicians. These NPs provide regular contact with the residents and the nursing home staffs. They are available to respond to problems early in their course and to provide preventive oversight by monitoring the status of their changes on a regular basis. Because they are frequently in each nursing home, they have regular contact with the staff and can provide informal (and formal) in-service training. The NPs help to train the nursing home staff in various aspects of care. In many respects they engender an atmosphere of a more caring nursing institution, and it may be that they are being mistaken for nursing home staff.[1] The work of the NPs is intended to supplement, not supplant, that of the primary care physicians, who continue to be paid on a fee-for-service

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arrangement at rates that are at least as high as those paid by Medicare. In addition, the physicians are paid for the time they spend in family or care-planning conferences and other activities not routinely covered by Medicare.[2]

The NPs spend about a third of their time in direct patient care. Another quarter of their time is devoted to communication with families, the primary care physicians, and the nursing home staff regarding specific patients. The remaining time is spread across a variety of administrative and other tasks.[1]

To improve the efficiency of their operation, Evercare strives to concentrate their enrollment in nursing homes where they can achieve a saturation effect. Evercare aims to enroll at least 50% of the residents. Their primary strategy for achieving this is to work with physicians who have a majority of patients in a given home; these are often also the medical directors. In this way they can work more intensively with a smaller number of homes and physicians.

In theory, the heavy investment in primary care can be repaid in two ways: by avoiding catastrophic events that require hospitalization and by managing those events in such a way as to avoid hospitalizing the residents. Ideally, active primary care should recognize problems earlier and manage them more aggressively, thereby eliminating the flare-ups that would require hospital admission. Unfortunately, despite the attraction of this premise, there is little evidence that this approach is successful, but some studies have suggested that active attention to high-risk patients can reduce hospitalizations. For example, close follow-up of recently discharged patients by NPs was associated with a lower readmission rate.[3,4] Use of teams of physicians and geriatric NPs concentrating on care of older people was reported to reduce the use of hospital days.[5] Programs that used group care techniques to manage outpatients with a given illness have likewise been shown to reduce hospital use.[6]

The second strategy, managing care differently, involves treating residents in the nursing home who might otherwise be sent to the hospital. In addition to having more active medical supervision from the NPs, Evercare also offers the nursing homes that agree to care for patients who would otherwise be hospitalized an incentive payment, referred to as an intensive service day (ISD). The ISD payment is designed to reimburse the nursing home for additional nursing care required, although no efforts are made to see if any such additional care is actually provided. In most cases, if more care were provided, it would likely have to come from diverting the care available to the rest of the residents in that facility on that shift, because it would be difficult to hire additional staff on short notice.

Previous studies have shown that the patients who enrolled in Evercare were generally comparable with those who did not, with the exception that Evercare enrollees were more likely to be demented. In a cross-sectional analysis of survey results, there were no differences in functional status or the extent of unmet needs between the Evercare enrollees and matched controls.[7]

This paper analyzes the use of services for Evercare and control patients to examine whether this program was able to achieve its goal of reducing hospital use by nursing home residents and, if so, by what means.

METHODS

As part of a Centers for Medicare and Medicaid Services (CMS)-mandated evaluation of the Evercare demonstration project, nursing homes participating in Evercare were contacted and enrolled in the study. Because resident enrollment in Evercare was voluntary, two different control groups were used to reduce the potential effects of selection bias. One control was composed of long-stay residents in Evercare-participating homes who did not themselves enroll in Evercare. The second control group was created by selecting long-stay patients from nursing homes that did not participate in Evercare.

Sampling

The study population includes nursing home residents from five Evercare demonstration sites. At each site the researchers sought to enroll 10 control facilities equivalent in size and ownership to 10 Evercare homes, but at two sites it was not possible to recruit enough facilities to meet this goal. A total of 44 pairs of Evercare and control facilities agreed to participate. Control facilities were matched to Evercare-contracted facilities based on location, size, and profit status. A census of each facility was completed for a specific day at each facility between February 1999 and August 1999 for the purpose of drawing the sample. From the census, the resident's Medicare Health Insurance Claim (HIC) number and other identifiers with which to confirm the HIC number were obtained. Where the HIC number was not available or correct, the remaining identifiers were used to identify the resident's HIC number, using CMS, Minimum Data Set (MDS), and UHC data.

Three subsets were selected from the study population. The Evercare subset included all residents who had been enrolled in Evercare before census. Only those residents who were enrolled in both Part A and Part B Medicare at some time during the study and who were not enrolled in any other HMO, based on Medicare enrollment data, were used in the control subpopulations. The control-out subset was selected from the control facilities. Residents of Evercare facilities that were not enrolled in Evercare during the study represented the control-in subset. To obtain an approximately similar distribution of Evercare and control study groups, control residents were matched with Evercare residents. The matching was implemented based on residents' admission date. An attempt to include age and sex into the matching algorithm had failed due to insufficient size of the control subsets. As a result of matching, every control-in and control-out resident was assigned the virtual Evercare enrollment date corresponding to that of the matched Evercare enrollee. This date was used when comparing baseline distributions of the populations.

Enrollment into the Evercare program was continuous. For the analysis of use a "virtual enrollment date" was attributed to each of the matched control residents reflecting the Evercare enrollment date of their respective matched experimental resident cases. Thus, the population from the time of each individual's enrollment or virtual enrollment forward is used, resulting in an accumulation of sample as the introduction of Evercare into each site and initial enrollment into the program progressed. Nursing home residents exited the study population through either

death or discharge from the nursing home in which they resided at the time of the census. A small number of residents exited the Evercare subpopulation through disenrolling from the Evercare program. The average Evercare disenrollment rate was 3% per month; almost all of this was due to death.

Data are presented as a comparison of the Evercare sample with each of the control samples (control-in and control-out). Because the eligible study population changed each month, data are reported in terms of person/months, with a different number (N) for each month for each sample. For example, in each month, the number of hospitalizations per 100 enrollees is calculated as the number of admissions starting in a month divided by the total number of persons in that month. To report results for longer periods of time, the results for each month were averaged to suppress random variations observed from one month to another. Individuals were followed for 15 months after the months in which they were censused.

Data Sources

Basic descriptive information on the Evercare and control samples was obtained from the Medicare-mandated MDS assessments that are required of all nursing home residents on admission and at subsequent prescribed intervals. When more than one MDS assessment was available during the study interval, the earliest report with the relevant information was used. The measure for dementia is the Cognitive Performance Scale (CPS)[8] The activities of daily living (ADL) dependency level was measured using the ADL scale developed for the MDS.[9,10] The prevalence of selected diagnoses was also taken from MDS data. Because MDS requires that only diseases that affect current health or treatment be recorded, some historical diagnoses may be underreported.

Administrative data for transactions involving the study population were obtained from CMS and UHC. The utilization data for the Evercare sample during the period of their enrollment came from the claims records of UHC. The utilization data for the control population and for Evercare enrollees before enrollment came from Medicare records. Care was taken to use the same definitions for each type of service to assure comparability across sources. Hospitalizations and physician visits were defined in terms of standard coding on the respective uniform billing forms. Because the ISD provided by the Evercare program is unique to this program, these services were identified in accordance with instruction from UHC. For hospitalizations and ISDs, same-day discharges and readmissions were treated as transfers, which did not change the incidence rate.

To examine the effect of primary care in reducing hospitalizations, hospitalizations and ISDs considered preventable, such as pneumonia, dehydration, hypertension, and urinary tract infections were identified. Preventable hospitalizations and ISDs were selected based on claims with the primary diagnosis among the ambulatory care sensitive conditions, as classified by Billings et al.[11] and the corresponding *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) codes. Additionally, admissions for discretionary surgical procedures were identified as those in which the first or second ICD-9 procedure code on the claim was among the Institute of Medicine's list of referral-sensitive surgeries.[12]

Because patients with dementia have been shown to have lower utilization rates,[13] and the Evercare enrollees included a disproportionately larger number of demented patients than either of the control groups, the effect of this difference was examined. Patients were categorized into levels of impairment using the maximum CPS calculated from all MDS assessments during the study period.[8]

A variety of methods was used to assess usage of professional services. The incidence of physician, NP, podiatry, and audiology services was obtained from the provider-based claims with an outpatient place of service. Physician and NP services were identified from claims with office, home, or nursing home visits or evaluation/management consultation Berenson-Eggers Type of Service (BETOS) codes. The Health Care Financing Administration (now CMS) developed BETOS codes from Health Care Financing Administration Common Procedure Coding System procedure codes for classification of physician claims into clinically relevant categories. BETOS definitions were then applied to Common Procedural Terminology (CPT) codes present in the Evercare data. Podiatry and audiology service counts include these BETOS codes as well as specialty-specific CPT codes. Slightly different methodology was used in determining use of therapy services. Institutional and provider claims were examined. Skilled nursing facility and outpatient institutional claims with speech therapy (ST), occupational therapy (OT), or physical therapy (PT) revenue center codes were included. Provider claims with a specialty type of ST/OT/PT or physiotherapy were also included. Unfortunately, the use of revenue center codes meant that the number of PT visits was not available. Payment for services is offered as a proxy for service count. It was assumed that, if a claim included PT charges, and the claim spanned multiple months, therapy was received throughout the claim period. Dollars were assigned to a month based on the proportion of the claim period that occurred in that month.

The outpatient treatment of mental disease and dementia was examined in greater depth. The authors were interested in examining mental health utilization for only those persons who had need of it. To determine which patients were in need of mental health services, all available sources of information were examined. If a patient had a paid mental health claim from an inpatient, outpatient, or provider source from January 1996 to December 2000, they were included in the denominator. Additionally, the diagnosis fields from MDS records were used. A mental health diagnosis from any source placed the person in the denominator for each month even if the diagnosis occurred before admission to the nursing home or after the month in question. Patients were divided into three categories based upon the type of diagnosis: dementia without other mental health diagnoses, dementia and other mental health diagnoses, and other mental health diagnoses with no dementia. Organic brain syndrome was included with dementia for the purposes of this analysis.

To calculate the numerator of qualifying outpatient mental health benefits, provider claims with a primary diagnosis of mental disease or dementia were selected. The

place of service requirement was the same as for the measures of provider services. Claims for mental health professionals such as social workers and psychologists were examined, as well as physicians, NPs, and physician assistants (PAs). In addition to the BETOS procedure codes included for regular doctor visits, BETOS-defined psychiatry specialty codes were examined. Depending on provider and procedure code, some mental health visits were also included in the count of physician visits. Mental health visits were broken into four categories: visits to psychiatrists; visits to nonpsychiatrically trained physicians; visits to psychiatrically trained nonphysicians (Only providers with specialized training are allowed to use psychiatry codes. Thus, NPs who used these codes were considered to be psychiatrically trained, and their visits were counted in this category along with visits to psychologists and social workers.); and nonpsychiatrically trained NPs and PAs.

Mortality rates could be assessed only subsequent to the census. Because the sample was identified from a cross-sectional census, by definition, all residents included had to have survived to the date of the census. Medicare enrollment and death data were obtained from the Medicare enrollment database, and HMO enrollment data were obtained from the Medicare Group Health Plan Master files. Enrollment and death data were verified using UHC enrollment files and the MDS.

Statistical Analysis

When testing whether observed differences of baseline characteristics between groups were statistically significant, chi-square and *t* tests were used. Subsequent Bonferroni corrections for multiple comparisons were applied to the diagnoses in Table 1. For between-group comparisons of resource utilization, general linear models[14,15] with Poisson and binomial random components (log and logit links, respectively) were used. The robust estimation of standard errors (sandwich estimator) was applied. Whenever possible, an unstructured correlation matrix was used. In cases in which the model failed to converge, an exchangeable (compound symmetry) correlation matrix was used. Adjustments were made for age, sex, race, Morris ADL score, diabetes mellitus, cardiac dysrhythmias, congestive heart failure, hypertension, arthritis, hip fracture, dementia (Alzheimer's or other), stroke (cerebrovascular accident, hemiplegia/paresis, transient ischemic attack, combined), Parkinson's disease, anxiety disorder and depression, asthma or emphysema, and active cancer. Age was coded as a categorical variable, with 10 levels defined by deciles. Stata (Stata Corp., College Station, TX) was used to fit the models.

RESULTS

Table 1 shows some of the basic descriptors of the Evercare sample and the two control groups taken from the MDS data. The demographic characteristics of the three groups are generally similar. The Evercare sample was significantly older than the control-in sample (average age at start of study period of 83.7 vs 81.4, $P<.001$), and more likely to be female (80.3% vs 72.6%, $P<.001$). The Evercare

Table 1. Characteristics of Subjects

Characteristic	Evercare (n = 1,936)	Control-In (n = 1,123)	Control-Out (n = 1,745)
Age, mean ± SD	83.7 ± 8.7	81.4 ± 11.9‡	84.0 ± 9.9
Female, %	80.3	72.6‡	78.1
White, %	83.2	85.3	91.4‡
Medicaid eligible			
Cognitive Performance Scale score, mean ± SD	3.1 ± 1.6	3.0 ± 1.9	2.0 ± 1.9‡
Morris ADL Score, mean ± SD	14.8 ± 8.9	15.2 ± 9.2	14.8 ± 9.1
Phillips ADL Score, mean ± SD	13.8 ± 7.2	14.0 ± 7.4	13.8 ± 7.3
Disease diagnoses, %			
Diabetes mellitus	19.0	19.6	18.7
Cardiac dysrhythmias	11.0	11.5	13.2
Congestive heart failure	18.3	16.3	20.3
Hypertension	44.2	39.1†	47.4
Arthritis	25.0	22.2	26.5
Hip fracture	8.1	6.4	6.9
Dementia (Alzheimer's or other)	63.6	55.3‡	51.5‡
Stroke (cerebrovascular accident, hemiplegia/paresis, etc.)	22.9	24.0	25.9*
Parkinson's disease	6.8	7.6	6.8
Anxiety disorder and depression	39.9	40.0	42.1
Asthma or emphysema	14.9	11.9*	15.5
Vision	25.4	20.9†	22.1*
Active cancer	6.1	7.8	6.5

Note: Each control group was compared separately with Evercare.
*$P<.05$; †$P<.01$; ‡$P<.001$.
SD = standard deviation; ADL = activities of daily living.

Table 2. Hospital Use: All Admissions

Rate per Month	Evercare	Control-In	Control-Out
Average number of patients	1,472	831	1,350
Average number of hospital admissions per 100 enrollees	2.4	4.6†	4.7†
Average number of ISD admissions per 100 enrollees	2.4		
Total of average number of hospital+ISD admissions per 100 enrollees	4.9	4.6	4.7
Average hospital days per 100 enrollees	13.5	31.2†	31.3†
Average ISDs per 100 enrollees	3.6		
Total of average hospital+ISDs per 100 enrollees	17.1	31.2†	31.3†
Average hospital length of stay	5.5	6.7*	6.7†
Average ISDs length of stay	1.5		
Average number of emergency department visits per 100 enrollees	3.3	6.3†	7.3†
Average number of persons with an emergency department visit per 100 enrollees	3.1	5.7†	6.6†

Note: Each control group was compared with Evercare for the corresponding time interval.
Risk adjustment was performed for the following 16 variables: age, sex, race, Morris activities of daily living score, diabetes mellitus, cardiac dysrhythmias, congestive heart failure, hypertension, arthritis, hip fracture, dementia (Alzheimer's or other), stroke (cerebrovascular accident, hemiplegia/paresis, transient ischemic attack combined), Parkinson's disease, anxiety disorder and depression, asthma or emphysema, and active cancer.
*$P<.05$; †$P<.001$.
ISD = intensive service day.

sample had fewer white residents than the control-out sample (83.2% vs 91.4%, $P<.001$). The average CPS score showed that the Evercare sample was significantly more impaired than the control-out sample (3.12 vs 2.80, $P<.001$). The Evercare sample had a higher prevalence of dementia and vision problems than either of the control groups. The control-in sample had a lower prevalence of hypertension and asthma/emphysema than the Evercare sample. The prevalence of other diagnoses was generally comparable across the groups. The monthly mortality rate for the period from April 1, 1999, through December 30, 2000, for the Evercare sample was 2.88%, whereas the rate for the two control groups was 2.66% for those in the same nursing homes and 2.73% for those in the matched nursing homes.

Table 2 shows the usage patterns for hospital services (including emergency rooms). In addition to the regular hospital statistics, the specific coverage of nursing home care in lieu of hospitalization (ISD) is shown for the Evercare sample. The Evercare sample experienced fewer hospital admissions and used fewer hospital days, but when the ISD admissions rate was included, the Evercare admission rate was virtually the same as that of the controls, although the total days used by Evercare patients were still fewer. Evercare patients had shorter hospital lengths of stay, and the ISD stays were shorter than those for a regular hospitalization. Emergency room (ER) use paralleled that for hospital admissions; the Evercare rate was about half that for the controls. Although many ER visits were associated with admissions, the rate of ER visits was higher than the admission rate, suggesting that some patients in all groups were sent back to the nursing home after their ER visits. The ER plus ISD rates were still slightly lower for the Evercare group than for the controls.

Table 3 examines the use of hospitals for so-called preventable and discretionary admissions. Because the number of these admissions was small, the data for the full period were pooled. The pattern for preventable admissions differs somewhat from that seen for all admissions. When hospital admission rates and ISD rates are combined, Evercare event rates (i.e., likelihood of a hospitalizable event) are lower than those of controls. For the control-out group, this difference was significant. The Evercare length of stay (LOS) was slightly less than that of the controls. The admission rate for discretionary surgery was low but equal across the three groups. Because ISDs would not be used for this purpose, there were none. The LOS was longer for the Evercare sample, but the difference was not significant.

Because the Evercare sample had more patients with dementia, and dementia has been shown to be associated with lower hospital use,[13] hospitalizations were examined while controlling for dementia status. The rate of hospital use by residents with different levels of cognitive impairment was examined; the hospitalization rate was lower with greater cognitive impairment in all three groups. The difference between Evercare and the controls persisted within each stratum.

Although no direct measures of quality are available, some inferences can be made. The hospitalization rate after an ISD was similar to that for rehospitalizations, suggesting that using ISDs was not associated with any greater risk of complications than admitting patients to the hospital. The ISDs seem to be used to manage appropriate problems. Pneumonia was highly represented in ISD use. More than one-third (34.2%) of the ISD admissions were for pneumonia, compared with 7.5% of control-in hospitalizations, 11.7% of control-out hospitalizations, and 6.5% of Evercare hospitalizations. No surgical cases were managed through ISDs. Presumably those managed through ISDs were more stable.

The use of professional services is shown in Table 4. The Evercare population was considerably more likely to be seen by a NP or a PA than that of either control group (121.3 visits per month per 100 enrollees compared with 4.4 and 2.5), but these visits did not appear to displace physician visits, which were also higher for Evercare. Evercare recipients were more likely than controls to see a

Table 3. Preventable Hospitalization

Preventable Hospitalization Rate per Month	Evercare	Control-In	Control-Out
Average number of patients in group	1,310	744	1,197
Average number of hospital admissions per 100 enrollees	0.3	0.8‡	0.9‡
Average number of ISD admissions per 100 enrollees	0.4		
Total of average number of hospital + ISD admissions per 100 enrollees	0.7	0.8	0.9*
Average hospital days per 100 enrollees	1.3	4.3‡	4.9‡
Average ISDs per 100 enrollees	0.7		
Total of average hospital + ISDs per 100 enrollees	2.0	4.3‡	4.9‡
Average hospital length of stay	4.6	5.4†	5.6‡
Average ISDs length of stay	1.7		

Note: Each control group was compared with Evercare.
Risk adjustment was performed for the following 16 variables: age, sex, race, Morris activities of daily living score, diabetes mellitus, cardiac dysrhythmias, congestive heart failure, hypertension, arthritis, hip fracture, dementia (Alzheimer's or other), stroke (cerebrovascular accident, hemiplegia/paresis, transient ischemic attack combined), Parkinson's disease, anxiety disorder and depression, asthma or emphysema, and active cancer.
*$P < .05$; †$P < .01$; ‡$P < .001$.
ISD = intensive service day.

podiatrist ($P < .001$). The use of audiologists in Evercare was consistent with the control-in group but slightly higher than in the control-out population. Use of OT, ST, or PT services was significantly less in the Evercare population in terms of expenditures per person.

The discrepancy in mental health care is examined in Table 5, which separates care for patients with dementia only from patients with dementia plus another mental health diagnosis and patients with other mental illnesses and no dementia. Because of the potentially confusing effect of NP visits, the table presents visit rates including and excluding them. Evercare patients with dementia and no other mental illness were more likely to be seen than were either control group, even when NP visits were removed from the numerator. Evercare dementia only patients were also more likely to receive multiple visits if a visit did occur. As expected, they were much more likely to be seen by a NP or PA and by a nonpsychiatric medical doctor. In general, for each type of mental health problem, Evercare patients received as much or more attention as the controls, with the exception of visits by a nonphysician health professional (i.e., a psychologist or social worker).

DISCUSSION

The pattern of usage suggests that Evercare has been successful in controlling hospital use, but the predominate method has been by substituting nursing home care for

Table 4. Professional Visits per Month per 100 Enrollees

Visits	Evercare	Control-In	Control-Out
Physician			
Average number of persons seen	77.6	56.5*	55.7*
Average number of visits	86.1	73.4*	70.0*
Nurse practitioner/physician assistant			
Average number of persons seen	83.9	3.5*	1.9*
Average number of visits	121.3	4.4*	2.5*
Podiatry			
Average number of persons seen	23.8	18.7*	23.6*
Average number of visits	24.2	19.2*	24.8*
Audiology			
Average number of persons seen	0.2	0.0	0.1
Average number of visits	0.2	0.2	0.1
Physical, occupational, and speech therapy			
Average number of persons seen	1.0	2.9*	2.4*
Average expenditures in month	541.8	3,232.8*	2,644.2*
Average cost/person with therapy	524.3	1,067.3*	1,090.0*

Note: Each control group was compared with Evercare.
Risk adjustment was performed for the following 16 variables: age, sex, race, Morris activities of daily living score, diabetes mellitus, cardiac dysrhythmias, congestive heart failure, hypertension, arthritis, hip fracture, dementia (Alzheimer's or other), stroke (cerebrovascular accident, hemiplegia/paresis, transient ischemic attack combined), Parkinson's disease, anxiety disorder and depression, asthma or emphysema, and active cancer.
*$P < .001$.

Table 5. Outpatient Evaluation/Management or Psychotherapy Visits for Mental Health Diagnoses in Persons with Evidence of Mental Health Disorders

Visit Rate*	Evercare	Control-In	Control-Out
Dementia only			
Average number of persons with dementia only in each month	95	77	114
Number of persons receiving a mental health visit	37.4	9.2†	7.1†
Number of persons receiving a mental health visit with a non-NP	13.7	8.8	7.0‡
Number of mental health visits (total)	52.0	9.8†	7.9†
Number of psychiatrist/neurologist visits	0.1	0.1	0.0
Number of visits with non-MD mental health professional	0	3.3†	0.9†
Number of visits with NP/PA	38.1	0.4†	0.1†
Number of visits with non-psych MD	13.8	5.9‡	6.9‡
Dementia and other mental illness			
Average number of persons with dementia+other mental diagnosis in each month	876	405	626
Number of persons receiving a mental health visit	47.2	18.0†	16.6†
Number of persons receiving a mental health visit with a non-NP	22.2	17.5†	16.2†
Number of mental health visits (total)	71.4	22.3†	22.2†
Number of psychiatrist/neurologist Visits	3.1	0.8†	2.9
Number of visits with non-MD mental health professional	1.2	10.1†	8.6†
Number of visits with NP/PA	46.9	1.0†	0.5†
Number of visits with non-psych MD	20.2	10.4†	10.2†
Other mental illness (no dementia)			
Average number of persons with other mental diagnosis (no dementia) in each month	165	165	262
Number of persons receiving a mental health visit	32.3	15.7†	12.5†
Number of persons receiving a mental health visit with a non-NP	16.0	15.2	12.4
Number of mental health visits (total)	55.7	21.5†	18.1†
Number of psychiatrist/neurologist visits	9.9	3.9§	4.7§
Number of visits with non-MD mental health professional	6.7	11.9	7.6
Number of visits with NP/PA	29.7	0.7†	0.2†
Number of visits with non-psych MD	9.6	4.9†	5.7§

Note: Each control group was compared with Evercare.
Risk adjustment was performed for the following 14 variables: age, sex, race, Morris activities of daily living score, diabetes mellitus, cardiac dysrhythmias, congestive heart failure, hypertension, arthritis, hip fracture, stroke (cerebrovascular accident, hemiplegia/paresis, transient ischemic attack combined), Parkinson's disease, asthma or emphysema, and active cancer.
*Average monthly mental health visit rate per 100 enrollees with history of treatment for the relevant diagnoses.
†$P<.001$; ‡$P<.01$; §$P<.05$.
NP = nurse practitioner; PA = physician assistant; MD = medical doctor.

hospital care on both the front and back ends. Evercare used ISDs to induce nursing homes to treat some patients without a transfer and discharged other patients from hospitals back to the nursing homes earlier than controls. There is also some indication that Evercare was able to reduce the incidence of events that traditionally require hospitalization and that are associated with the use of primary care. The rate of patient attention represented by the sum of generalist physician and NP visits was more than twice that received by controls. This difference in hospital use cannot be attributed to the preponderance of demented clients, because the pattern holds for all levels of cognitive impairment. The lower rate of ER use by Evercare enrollees can be interpreted as a sign of fewer serious events or a tendency to manage some of those in the nursing home.

Although it is remotely possible that the shifts in nursing staffing from employing ISDs for Evercare residents could have influenced the higher hospitalization rates in the control-in group, this effect seems unlikely. The extra care demands would have had to have occurred at virtually the same time that control patients needed critical care. In practice, the ISDs were still rare and were dispersed over time. Moreover, the same pattern is seen in control-out homes, where the resource shift could not occur.

Evercare also shows little evidence of limiting the use of other services or substituting less-trained providers. The greater attention to dementia care reflects the patient composition, but for other mental healthcare, Evercare patients also received more treatment from most professionals, including specialists.

Evercare enrollees received fewer therapy services than did the controls. It is not clear whether the latter level represents over-use or whether needed services were being denied, but there are no indications of any adverse effects that might be attributed to less therapeutic care. In a cross-sectional analysis, there were no significant differences in functioning.[7]

It appears that the Evercare approach reduced hospital costs. Because the authors were not privy to the actual financial operations of this program, we can only speculate about the overall financial efficiency. Using the data for the postcensus period, if it is assumed that a hospital day costs

about $1,000, and an ISD costs about $425 (based on Evercare data), then Evercare is saving about $193,000 per 100 enrollees annually solely through reduced hospital costs. An NP, who costs about $90,000 a year (with fringe benefits), can manage a caseload of about 85 patients. Thus, without considering the other administrative costs involved, the use of NPs accounts for a savings of about $88,000 per NP. The annual savings in emergency room visits (estimated at $300 each, including ambulance costs) would add another $4,300 in savings.

Admittedly, this calculation, which does not reflect the total savings from Evercare's managed care approach, makes sense only in the context of a per diem hospital reimbursement approach, but that is the predominant pattern that Evercare currently uses. In a Diagnosis Related Group situation, the savings would accrue only from avoiding hospitalizations, which was also accomplished (about 2 fewer admissions per 100 enrollees per month). It appears that the strategy of using NPs to provide more-intense primary care to nursing home residents allows a more efficient way to provide crisis care but does not prevent the crisis itself.

Because this study relied on a quasi-experimental design, there is a concern about selection bias. Residents and their families who enroll in Evercare may be seeking or willing to receive a different level of service. In general, they receive more service, in terms of clinical attention (because the work of the NPs is additive to that of the primary care physicians) and personal attention (the NPs spend a substantial amount of time communicating with family members). This study cannot specifically attribute the differences in hospitalization rates to the use of primary care compared with the use of ISDs or other managed care actions, but the differences in admission rates for preventable hospitalizations suggest that primary care may be effective as intended. It is not clear how well enrollees appreciate the goals of managed care in terms of restricting hospital care. In an earlier survey, there was no indication that Evercare families or residents believed that they were being underserved; nor was there any difference in the rate of advance directives.[7] The study deliberately used two control groups and many adjusters to address the concerns about the quasi-experimental nature of the design. Likewise there might be concerns that the nursing facilities in the control-out group were self-selected and might have been different from those in Evercare. The authors examined potential differences earlier and could not find any based on available data.[7]

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