Potential Cost Savings in Residential Care for Alzheimer's Disease Patients for Alzheimer's Disease Patients

Joel Leon, PhD, Delores Moyer, GNP, MSN, FAAN
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Joel Leon, PhD,1 and Delores Moyer, GNP, MSN, FAAN2

Nursing home care continues to be the single largest component of long-term care expenditures for the elderly population. The General Accounting Office estimated that of the $90.9 billion spent for long-term care in 1995, nearly 71% paid for nursing home care (U.S. Congress General Accounting Office, 1998a). It appears imperative to find ways to reduce this large and growing public and private financial burden.

Persons with dementia comprise a substantial portion of the elderly nursing home population, and a significant portion of those with dementia have Alzheimer's disease (AD). Of the 1.56 million nursing home residents in 1995, nearly 48% of the “long-stay” residents, approximately 746,100, were estimated to have some form of diagnosed dementia (Krauss & Altman, 1998), up from the 1987 estimates of 43% (Maslow, 1994; see Appendix, Note 1). The actual number of residents with possible dementia may even be larger if estimates go beyond diagnosed conditions and include persons with cognitive impairments (Maslow, 1994; Leon, Cheng, & Neumann, 1998). Not all nursing home residents with dementia have Alzheimer’s disease (AD). The actual percentage is presently unknown. However, Katzman, Lasker, and Bernstein (1986) estimated that about 66% of all patients with degenerative dementia have AD. Using the 66% estimate, in 1995 approximately 492,400 patients, nearly 32% of all nursing home residents, could have had AD. If correct for 1995 with an average annual per resident cost exceeding $40,000 (U.S. Congress Government Accounting Office, 1998b), then of $64.3 billion spent on nursing home care, upwards of $19.7 billion would have covered the costs for persons with AD.

Nursing home expenditures for AD patients can be expected to grow over the coming decades. A 1998 report from the General Accounting Office estimated a 24% increase from 1995 to 2005, with a 51% increase from 1995 to 2015 (U.S. Congress Government Accounting Office, 1998a). Additionally, even though families are generally reluctant to place their relatives into residential settings, the progressive degenerative nature of AD inevitably results in placement for the majority of patients (Mittelman, Ferris, Shulman, Steinberg, & Levin, 1996).

Despite growth in assisted living environments that specialize in the care of elderly persons with dementia, the vast majority of AD residential placements occur in nursing facilities. Moreover, there appears to be a preference for placement in more specialized nursing home settings, as evidenced by the dramatic growth in the number of special care units (SCUs) for persons with dementia (Leon, Cheng, & Alvarez, 1997). Payments for long-term nursing home care are almost equally divided between public (52%: Medicaid 38%, Medicare 13%, other public sources 1%) and private sources (48%: out-of-pocket 47%, insurance 1%; U.S. Congress Government Accounting Office, 1998b). Any continued growth in the number of AD patients will add to the expenditures for nursing home care made by public programs and individual families.

In the past decade, there has been substantial growth in the number and capacity of assisted living environments, with more recent growth in specialized assisted living facilities for people with AD (U.S. Congress Government Accounting Office, 1997). Several studies have concluded that the cost of residential care is substantially cheaper in assisted living facilities when compared with nursing homes (Kane & Wilson, 1993; Lewin, 1996; Manard, 1992; Mollica & Snow, 1996; U.S. Congress General Accounting Office, 1997). A recent study also showed that care for AD patients in assisted living facilities was substantially cheaper than care in nursing homes (Leon et al., 1998).

Key Words: Assisted living, Alzheimer’s disease, Nursing home care, Costs of care

Data from a 1996 cross-sectional study examining the costs of care for Alzheimer’s Disease patients are used to estimate the potential cost savings that could result by substituting assisted living for nursing home care for AD residents with health profiles that appear to be manageable within assisted living facilities that specialize in dementia care. Results indicate that up to 13.9% of nursing home costs could be saved, making such a service substitution an attractive alternative in the provision of residential care for certain categories of AD patients.

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There is no uniform standard of what constitutes assisted living. It is broadly defined as a combination of housing and supportive services designed to provide care to individuals who require assistance with the tasks of daily living, but who do not generally need the level of skilled nursing care provided in nursing homes (U.S. Congress Government Accounting Office, 1997). Are there nursing home residents with AD who could be properly cared for in such settings?

The progressive nature of AD, as well as the accompanying increases in comorbid health conditions that arise as residents age and AD severity increases, clearly prevents any blanket substitution of care in assisted living facilities for care in nursing homes. Although assisted living facilities are not staffed, equipped, nor intended to routinely serve residents with serious, medically unstable, physical health conditions, a growing number of assisted living facilities are organized to provide supportive care to AD patients with impaired cognition and moderately disruptive behavior. Additionally, a recent study of a cohort of dementia admissions to a nationwide sample of nursing facilities showed that a substantial portion of dementia admissions presented fewer coexisting physical health conditions than the typical nursing home admission (Leon, 1998). Thus, at any given time, it is likely that a portion of the more physically intact AD population residing in nursing homes could be properly cared for in specialized assisted living facilities, resulting in substantial cost savings. If we could estimate this number, we could begin to estimate the size of the potential cost savings.

There are no standards to determine which AD nursing home residents could be served in specialized assisted living facilities. Moreover, regulatory constraints will always play a determining role in residential placements. However, it seems reasonable to assume that a key element in determining the appropriateness of a given placement is the physical health status and AD severity of the patient.

A recent cross-sectional study of the costs and service use levels of AD patients provides an unusual opportunity to begin the process of estimating these potential cost savings. The following, which is not meant to be definitive but, rather, a first attempt, uses established and reliable measures of physical health status and AD severity to estimate the percentage of AD nursing home residents who potentially could be managed in specialized assisted living environments. Using estimates of residents at low, mild, and moderate levels of physical health severity, and 1996 cost differences between assisted living and nursing home care, the study suggests the level of potential savings that are achievable.

Methods

Subjects and Study Design

The data for this analysis come from a large cross-sectional study that recruited 679 AD patient/family caregiver pairs from 13 U.S. sites, distributed in nine states over a 6-month period (July–December 1996). The parent study recruited from four managed care organizations, four academic and community medical centers, three nursing homes, and two assisted living facilities that specialized in the provision of care for people with AD.

The sample for the present study includes the 325 nursing home (n = 164) and assisted living facility (n = 161) residents. The sampling frame was all current patients who met NINCDS/ADRDA criteria for probable AD and had family caregivers. Response rates were 97.6% for the nursing homes and 95.3% for the assisted living facilities.

Although not a randomly selected sample of AD patients from a representative sample of nursing homes and assisted living facilities, the demographic characteristics of the sample closely resemble patient profiles from previous large scale studies of nursing home residents with dementia (Leon, 1998; Manton, Woodbury, & Cornelius, 1995; Welch, Walsh, & Larson, 1992). The age, gender distribution, and marital status of the sample are also generally similar to the sample of nursing home residents from the 1995 National Nursing Home Survey. Although the income level of the present sample is substantially higher than the income levels of the general nursing home population, there is no reason to believe that this difference represents a form of bias that would limit the generalizability of the present findings. Residents’ income does not play a direct role in any of the analyses, and all other resident characteristics appear to resemble the typical nursing home resident with dementia.

Measures

Clinical staff at each site used the Clinical Dementia Rating Scale (CDR) to classify AD disease severity levels; the Cumulative Illness Rating Scale (CIRS-g) to ascertain patient comorbid conditions; and the 36-Item Short-Form Health Survey (widely known as the SF-36) to collect functional health status information. Other patient data included demographic and service use information. Utilization data were collected through patient records and telephone interviews with the patient’s primary family caregiver.

The Clinical Dementia Rating Scale (CDR) is a clinical assessment tool widely used to classify persons with AD into six disease stages (Hughes et al., 1982; McCulla et al., 1989; Morris et al., 1989). The overall assessment is calculated from scores ranging from 0 to 3 to 5 on six cognitive domains: (1) Memory, (2) Orientation, (3) Judgment and Problem Solving, (4) Community Affairs, (5) Home and Hobbies, and (6) Personal Care. The information was recorded by a clinician during structured interviews with the patient and the patient’s caregiver. A standard scoring algorithm is used to calculate an overall rating referred to as the CDR score, which classifies AD patients into one of six ordinal disease stages: questionable = 0.5, mild = 1, moderate = 2, severe = 3, profound = 4, and terminal = 5 (Dooneief, Marder, Tang, & Stern, 1996; Morris, 1993; Patterson et al., 1997).
The CIRS-g Severity Index (CIRS-g-SI) was used to categorize physical health severity because it had been previously validated with residential elderly populations. For example, Parmelee and colleagues (1995) showed that differences in the CIRS-g-SI were strong predictors of subsequent levels of mortality, morbidity, medication use, and clinical laboratory findings. Following the formulation used by Parmelee and associates (1995), the nursing residents were categorized into four mutually exclusive groups, based on the quartile distribution of the CIRS-g-SI scores. We refined this distribution by using AD severity levels as measured by the CDR. All residents in the terminal or profound AD severity levels were considered to have serious physical health problems, regardless of their actual CIRS-SI scores.

For comparative purposes, we also created a dichotomous measure of life-threatening conditions using the six CIRS-g items shown by Parmelee, Thuras, Katz, and Lawton (1995) to be significant predictors of mortality: (1) cardiac conditions, (2) respiratory illnesses, (3) upper and (4) lower gastrointestinal conditions, (5) renal diseases/conditions, and (6) genitourinary problems. Residents were coded as having a life-threatening health condition if they were rated as having severe impairment on any one of these items.

The 36-Item Short-Form Health Survey (SF-36) is a widely used and validated measure for collecting health status information (Lyons, Perry, & Littlepage, 1994). It provides eight multi-item subscales derived from yes or no questions and from 3, 5, or 6-point Likert-type scales. The eight subscales cover: (1) physical functioning, (2) role limitations due to physical health problems, (3) bodily pain, (4) general health perceptions, (5) vitality, (6) social functioning, (7) role limitations due to emotional problems, and (8) mental health status. The present analyses used the physical functioning subscale and the SF-36 overall physical health summary measure, referred to as the PCS. The physical functioning subscale represents the person's ability to perform everyday physical tasks such as walking, lifting and carrying groceries, and climbing flights of stairs. The physical health summary measure is a broader measure of general health status and is calculated using a standard algorithm comprised of the eight specific subscales. Both SF-36 measures are transformed into standardized scores ranging from 0 to 100, where 100 represents the highest possible level of functioning (Ware, Snow, Kosinski, & Gandek, 1993; Ware, Kosinski, & Keller, 1994).

The SF-36 information on the AD patient was collected through an interview with a formal care provider from the nursing home or the assisted living facility (see Appendix 1, Note 2). In the present analysis the PCS is used to compare the different groups of residents as a general measure of overall health, and the physical functioning subscale is used as a surrogate measure for comparing functional limitations.

Measurements of Services Use and Costs

Formal Services: Use and Costs.—The categories of formal health services included: (1) number of hospital days from overnight hospital stays (IP); (2) number of emergency room visits (ER); (3) average number of doctor visits; and (4) total number of prescribed medications. All residential patients were in their respective settings for at least one month, and formal services for residential patients included charges for 30 days of either intermediate nursing home care or residency in an assisted living facility.

Estimates of use for IP days, ER visits, and prescribed medications came directly from the family caregivers and facility records and covered the 30 days prior to the interview, or the last month prior to the review. Number of physician visits was derived from AD patients in the 1994 Medicare Current Beneficiary Survey (MCBS; see Appendix, Note 3).

Unit cost estimates were derived from various secondary sources representing national cost estimates (see Appendix, Note 4). All service costs were standardized to represent monthly costs, and adjusted to reflect 1996 constant dollars using CPI adjusters for different categories of costs (see Appendix, Note 5).
Results

Comparisons of the Residential Samples

Figure 1 presents the cumulative frequencies on the SF-36 Physical Functioning Subscale for the nursing home and assisted living AD samples. For comparative purposes, the figure also presents the cumulative frequency for the 354 AD community patients who participated in the larger cross-sectional study. Recalling that the SF-36 scores are standardized so that a score of 100 represents no deficits in physical functioning, as could be expected, the distributions show that the samples from both residential settings presented dramatically lower levels of physical functioning than the sample of community patients. For example, more than 50% of the community patients had physical functioning scores greater than 60, but less than 33% of the assisted living sample and 5% of the nursing home sample had comparable levels.

In comparing the two residential samples in Figure 1, it is obvious that the assisted living sample presented significantly higher levels of physical functioning than the nursing home sample. The distributions also show that both settings serve AD populations with broad ranges of physical functioning, and despite the large overall differences, the distributions do overlap, particularly at the lower end of the spectrum. Although a direct measure of ADL capacities would be preferable for comparing the functional limitations of the samples, as measured by the SF-36 scale, it is apparent that portions of the nursing home AD sample solidly fall within the range of physical functioning levels of the assisted living AD sample.

Figure 2 compares the distributions for the assisted living and nursing home samples classified into the three physical illness severity groups. As displayed in Figure 2, although the three groups showed relatively similar percentages of each sample when taken together (65% vs 70%), the percentage distributions of each individual group differed considerably between the settings. The relatively equal distribution of the nursing home sample across the three groups (low-severity, 23%; mild-severity, 22%; and moderate-severity, 20%) is directly attributable to the way the groups were defined as the quartile distribution of the illness severity measure. In contrast, the low- and mild-severity illness groups encompass 65% of the assisted living sample, and only 5% were categorized in the moderate-severity group. The distributions clearly reiterate the finding from Figure 1, that, overall, the AD patients in the assisted living facilities were significantly healthier than the nursing home sample. However, considerable overlap is apparent.

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Table 1 compares the demographic and health status characteristics of the two residential samples. AD residents in assisted living facilities were significantly younger, had higher educational levels, and were more likely to still be married and have spouse caregivers. They also presented significantly lower AD severity levels and higher levels of overall health status and physical functioning. In contrast, although the nursing home sample presented a significantly higher percentage of residents with severe potentially terminal health conditions, the CIRS-g Severity Index for the two samples showed no significant difference.

The significant differences between the assisted living and nursing home samples in the percent married (25% vs 15%, respectively) and the percent with spouse
caregivers (19% vs 7%, respectively), pose the question whether health status alone is a sufficient condition to determine the appropriateness of either setting. The bivariate relationships imply that AD patients with similar health conditions but without the presence of a 24-hour-a-day spouse caregiver may have no choice but to go to a nursing home. However, in multivariate models (not shown) where residence in assisted living was treated as a 0,1 dependent variable, and age, gender, marital status, caregiver type, number of comorbid conditions, and AD severity were systematically entered into the models as predictor variables, only age, number of comorbid conditions, and AD severity were statistically significant in the full model (adjusted $R^2 = .24$). When age and gender were absent, having a spouse caregiver became significant, but

Table 1. Comparison of Demographic and Health Status Characteristics of Alzheimer's Disease Patients in Nursing Homes and Assisted Living Facilities

<table>
<thead>
<tr>
<th>Characteristics of Residents</th>
<th>Total Sample $(N = 325)$</th>
<th>Assisted Living Facility Residents $(n = 161)$</th>
<th>Nursing Home Residents $(n = 164)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age***</td>
<td>84.64 (7.39)</td>
<td>82.61 (7.03)</td>
<td>86.64 (7.20)</td>
</tr>
<tr>
<td>Percent Male (%)</td>
<td>20% (0.02)</td>
<td>24% (0.03)</td>
<td>16% (0.03)</td>
</tr>
<tr>
<td>Married (%) **</td>
<td>20% (0.02)</td>
<td>25% (0.03)</td>
<td>15% (0.03)</td>
</tr>
<tr>
<td>Has Spouse Caregiver (%)***</td>
<td>13% (0.02)</td>
<td>19% (0.03)</td>
<td>7% (0.02)</td>
</tr>
<tr>
<td>Years of Education***</td>
<td>11.30 (4.23)</td>
<td>12.06 (3.82)</td>
<td>10.57 (4.48)</td>
</tr>
<tr>
<td>Income</td>
<td>$60,708 (30,179)</td>
<td>$60,466 (31,043)</td>
<td>$60,945 (29,399)</td>
</tr>
<tr>
<td>CDR Score***</td>
<td>2.44 (1.01)</td>
<td>2.16 (0.97)</td>
<td>2.72 (0.97)</td>
</tr>
<tr>
<td>CIRSc-Severity Index</td>
<td>2.09 (0.46)</td>
<td>2.06 (0.53)</td>
<td>2.11 (0.36)</td>
</tr>
<tr>
<td>Has Possible Terminal Conditions (%)***</td>
<td>44% (0.03)</td>
<td>34% (0.04)</td>
<td>54% (0.04)</td>
</tr>
<tr>
<td>SF-36 Physical Functioning Subscale***</td>
<td>33.32 (30.94)</td>
<td>46.7 (32.04)</td>
<td>20.15 (23.30)</td>
</tr>
<tr>
<td>SF-36 Physical Health Status Summary***</td>
<td>40.26 (9.94)</td>
<td>42.34 (11.01)</td>
<td>38.21 (8.29)</td>
</tr>
</tbody>
</table>

Notes: Parentheses contain Standard Deviations for means and Standard Errors of the Estimate for the percentages; asterisks indicate significant differences between assisted living and nursing home residents: *$p < .05$; **$p < .01$; ***$p < .001$. Source: Aricept™ Cross-Sectional Outcomes Research Study.
added less than 3% to the overall adjusted $R^2$ of .22. These results indicated that number of comorbid conditions and AD severity were the predominant, but not exclusive, predictors of the type of setting.

**Demographic Characteristics and Health Status of the Potential Nursing Home Transfer Groups**

Table 2 compares the demographic and health status characteristics for each of the three defined nursing home illness-severity groups, with the AD residents in assisted living. There are clear differences between the assisted living residents and each group.

All three transfer groups were significantly older. The mean ages for the three transfer groups are around 87, whereas the mean age for the assisted living residents is closer to 83. Although the age distribution for the assisted living residents shows some variation, only 29% were over the age of 87.

Differences on the other demographic characteristics were specific to each group. The percentage married for the mild- and moderate-severity groups was significantly lower than the residents in assisted living. Similarly, the percentage of residents with spouse caregivers was significantly lower for the low- and moderate-severity groups, although in general, few AD residents in either setting have a spouse caregiver. Compared with the assisted living residents, only the moderate-severity group presented significantly lower educational levels. The educational levels of the other transfer groups are almost identical to those in assisted living.

The transfer groups also showed differences on the health status. All three groups presented significantly lower levels of physical functioning as measured by the SF-36 subscale: 31.5, 25.4, and 15.15, respectively, compared with 46.7 for the assisted living residents.

However, in contrast to the narrow age distribution, the distribution for physical functioning among the assisted living residents is broader, and there is considerable overlap between those in assisted living and those in the different transfer groups. The means of the transfer groups respectively encompass 40%, 36.6%, and 28% of the assisted living residents (Figure 1). On the other measures of health status, including the measure of AD severity, only the moderate-severity group showed consistently poorer health status. In fact, the low- and mild-severity groups presented significantly lower scores on the CIRS-g Severity Index compared with the assisted living residents indicating less physical health acuity. Also, only 5% of the low-severity group had possible terminal conditions, compared with 34% for the assisted living residents.

In summary, the AD nursing home residents in the three physical illness severity groups could be generally characterized as the following: the low-severity group consisted of AD residents in the mild to moderate stages of AD who were in relatively good physical health, where their level of physical functioning was well within the range of many AD residents in assisted living facilities; the mild-severity group included AD residents in the moderate to severe stages of AD who had ongoing physical health problems, but with levels of physical functioning still within the range of AD patients in assisted living facilities; and the moderate-severity group encompassed AD residents in the moderate to severe stages of AD whose physical health status was more marginal. They appeared to be a more vulnerable population, with their level of physical functioning at the very lowest end of the range of AD residents in assisted living.

**Potential Cost Savings**

Previous analyses of the cross-sectional data estimated that in 1996 the average monthly cost for nursing home care for AD residents was $3,528, or $42,336 on an annual basis (Leon et al., 1998). Table 3 presents elements from a regression model on the monthly cost of formal care for the residential AD patients, where

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**Table 2. Comparison of Demographic and Health Status Characteristics of Alzheimer's Disease Patients in Assisted Living Facilities With Each Potential Nursing Home Transfer Group**

<table>
<thead>
<tr>
<th>Characteristics of Residents</th>
<th>Assisted Living Facility Residents (n = 161)</th>
<th>Low-Severity Transfer Group (n = 38)</th>
<th>Mild-Severity Transfer Group (n = 36)</th>
<th>Moderate-Severity Transfer Group (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>82.6 (7.03)</td>
<td>86.7 (6.4)***</td>
<td>87.0 (8.5)***</td>
<td>87.5 (6.4)***</td>
</tr>
<tr>
<td>Male (%)</td>
<td>24% (0.03)</td>
<td>10.5% (0.05)</td>
<td>16.7% (0.06)</td>
<td>12.5% (0.06)</td>
</tr>
<tr>
<td>Married (%)</td>
<td>25% (0.03)</td>
<td>13.2% (0.06)</td>
<td>8.3% (0.05)</td>
<td>9.4% (0.05)***</td>
</tr>
<tr>
<td>Has Spouse Caregiver (%)</td>
<td>19% (0.03)</td>
<td>2.6% (0.03)***</td>
<td>8.3% (0.05)</td>
<td>3.1% (0.03)**</td>
</tr>
<tr>
<td>Years of Education</td>
<td>12.06 (3.82)</td>
<td>12.3 (2.3)</td>
<td>12.0 (2.5)</td>
<td>10.6 (3.0)**</td>
</tr>
<tr>
<td>Income</td>
<td>$60,466 (31,043)</td>
<td>$56,316 (29,309)</td>
<td>$64,236 (26,751)</td>
<td>$55,937 (31,100)</td>
</tr>
<tr>
<td>CDR Score</td>
<td>2.16 (0.97)</td>
<td>1.99 (0.60)</td>
<td>2.39 (0.60)</td>
<td>2.44 (0.62)*</td>
</tr>
<tr>
<td>CIRSg-Severity Index</td>
<td>2.06 (0.53)</td>
<td>1.67 (0.14)**</td>
<td>1.97 (0.56)*</td>
<td>2.2 (0.54)**</td>
</tr>
<tr>
<td>Has Possible Terminal Conditions (%)</td>
<td>34% (0.04)</td>
<td>5.0% (0.04)**</td>
<td>36.1% (0.08)</td>
<td>75.0% (0.08)**</td>
</tr>
<tr>
<td>SF-36 Physical Functioning Subscale</td>
<td>46.7 (32.04)</td>
<td>31.5 (25.73)**</td>
<td>25.4 (23.52)**</td>
<td>15.2 (17.20)**</td>
</tr>
<tr>
<td>SF-36 Physical Health Status Summary</td>
<td>42.3 (11.01)</td>
<td>41.5 (8.44)</td>
<td>38.6 (8.33)</td>
<td>36.9 (6.68)**</td>
</tr>
</tbody>
</table>

Notes: Parentheses contain Standard Deviations for means and Standard Errors of the Estimate for the percentages; asterisks indicate significant differences between assisted living and nursing home residents: *p < .05; **p < .01; ***p < .001. Source: Aritept™ Cross-sectional Outcomes Research Study.

* t tests are run between the assisted living resident and those in each severity transfer group.
physical health status was measured by the number of comorbid conditions and nursing home residence appeared as a dummy variable (1 equaling nursing home residence). The model also contained a matrix of control variables, including AD severity measured as a contrast variable (not shown). The results showed that independent of residential setting, on the average, each additional physical illness presented by the AD patient increased monthly costs by $66 (\( p < .01 \)). Thus, monthly costs of care increased for the more physically frail AD patients, regardless of the setting. Additionally, placement in a nursing home increased monthly costs by an average of $761 (\( p < .001 \)) over the cost of placement in assisted living facilities, after controlling for differences in AD severity, number of comorbid conditions, and demographic characteristics.

Using the net incremental cost difference between nursing home and assisted living care, the estimated monthly assisted living cost in 1996 was $2,767, or $33,204 on an annual basis.

Table 4 shows the potential annual cost savings from substituting care in assisted living facilities for nursing home care for the three identified groups of nursing home residents. When all residents remained in the nursing home, the yearly total cost of care was $6.9 million. To illustrate the logic of the table, if a blanket substitution of assisted living for nursing home care were possible, a maximum savings of nearly $1.5 million, or 21.6% of all residential costs, could be achieved. Because such a blanket substitution is unrealistic given the diverse health status characteristics of the AD nursing home sample, Table 4 shows the potential savings for each of the three illness-severity groups when assisted living is substituted for nursing home care. Transfer of the low-severity group, 23% of nursing home AD residents, would reduce the cost of residential care by $347,016, or about 5.0%. If nursing home residents classified in the mild-severity group were transferred, another 22% of the AD nursing home residents would be served in assisted living facilities, with cost savings of an additional $328,752, or slightly more than 4.7%. Finally, if those classified in the moderate-severity group were transferred, an additional 20% of the AD nursing home population would be served in assisted living facilities, at an additional cost savings of $292,224, or 4.2%. If all three illness severity groups were served in assisted living facilities rather than nursing homes, a total cost savings of 13.9% could be achieved.

Discussion

Estimates indicate that the size of the AD population will increase substantially over the coming decades. While current pharmaceutical treatments appear to show short-term improvements in cognitive performance, until interventions are developed that actually prevent, or significantly retard the progressive degenerative nature of AD, caregivers and public programs will face the monumental task of paying for residential care for a majority of AD patients. Because it is both expensive and jointly paid for with public and private resources, reducing the costs of residential care would appear to be a desirable outcome with a broad base of support.

The present annual cost differential between nurs-

<table>
<thead>
<tr>
<th>Alternative Definitions of Nursing Home Residents Eligible for Assisted Living*</th>
<th>Number (percent) of Nursing Home Residents Eligible for Assisted Livingb</th>
<th>Annual Cost of Nursing Home Care for Eligible Transfer Groups ($42,336/patient)</th>
<th>Annual Cost of Assisted Living for Eligible Transfer Groups ($33,204/patient)</th>
<th>Amount of Savings if Assisted Living is Substituted for Nursing Home Care</th>
<th>Percent of Savings in Residential Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-0-</td>
<td>$6,943,104</td>
<td>-0-</td>
<td>-0-</td>
<td>-0-</td>
</tr>
<tr>
<td>All Nursing Home Residents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-Severit Group</td>
<td>164 (100%)</td>
<td>$1,608,768</td>
<td>$5,445,456</td>
<td>$1,497,648</td>
<td>21.6%</td>
</tr>
<tr>
<td>Mild-Severit Group</td>
<td>38 (23%)</td>
<td>$1,261,752</td>
<td>$347,016</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Moderate-Severit Group</td>
<td>36 (22%)</td>
<td>$1,195,344</td>
<td>$328,752</td>
<td>4.7%</td>
<td></td>
</tr>
<tr>
<td>All Levels of Severity</td>
<td>106 (65%)</td>
<td>$1,354,752</td>
<td>$292,224</td>
<td>4.2%</td>
<td></td>
</tr>
</tbody>
</table>

*See text for definitions of eligibility groups.
*bPercent is of all nursing home residents.
would need to make substantial investments in the AD residents, the burgeoning assisted living industry would appear to be at least one prerequisite to establishing a more widespread substitution, it would be desirable to demonstrate that including large numbers of AD patients in assisted living care, which would ultimately reduce, if not erase, potential savings. Careful screening for health problems over and above the need for personal assistance would appear to be at least one prerequisite assisted living would need to establish to prevent the possible erosion of the cost differentials. This screening process, of course, would also marginally increase operating costs.

Additionally, while assisted living environments have grown substantially in the last 5 years, growth in the provision of specialized AD care remains a very small component of assisted living care. In order to adequately accommodate an additional 100,000 to 320,000 AD residents, the burgeoning assisted living industry would need to make substantial investments in the development and expansion of specialized AD programs and facilities. Beyond the bricks and mortar investment, the industry would need to control the costs of care to maintain or expand the current cost differential and simultaneously maintain high quality care.

Although larger assisted living corporations are likely to establish and maintain quality standards, such standards may not necessarily be established across the diverse range of assisted living organizations that currently exist within the industry. Of course, as evident in the nursing home industry, establishment of regulatory standards cannot guarantee that there will not be lapses in the quality of care. Additionally, the imposition of regulations can be double-edged. Although attempting to maintain quality, regulations can increase costs and inhibit the application of novel and innovative approaches to care.

An industry-wide monitoring of the quality of care would perhaps seem more appropriate. Industry-wide guidelines, rather than legislatively mandated regulations, would push the industry toward quality without creating conditions that prevent innovation. Additionally, in contrast to the nursing home industry, which after decades of existence has begun to actively implement quality of care standards as a result of legislated mandates, the lack of centralized regulation either by the industry or by public authorities has been one of the hallmarks of the assisted living industry. Establishing industry-wide guidelines for the care of AD patients could face substantial resistance.

Another obstacle impeding widespread substitution is the general lack of public payments for AD patients in assisted living facilities. Currently, the Medicaid program, the single largest public program covering nursing home care for low income residents, does not generally cover care in assisted living environments unless the state Medicaid program has sought special waiver status from the Health Care Financing Administration. According to a report issued by the National Academy for State Health Policy, in 1996, only 22 states made Medicaid funds available for assisted living (Mollica & Snow, 1996), and it is unclear which of these states cover the costs of specialized assisted living care for AD patients. Additionally, if such Medicaid payments did become widely available, it would be inevitably accompanied by increased government regulation, and it could be expected that the imposition of regulations would face widespread industry resistance. The imposition of regulations could also be expected to result in higher operating costs which could threaten the very essence of what makes assisted living so desirable.

Finally, because a sizable portion of the nursing home population has AD, or at least some form of dementia, further expansion into the provision of care for AD residents by the assisted living industry could be expected to produce growing resistance from the nursing home industry, which already sees the assisted living industry as encroaching upon its market. Some of the resistance could be expected to occur through the imposition of public regulation.

The best long range outcome would be the continued process of fully developing the care continuum...
that has always been envisioned, where each industry serves a particular niche along the residential service continuum. Some large corporations will straddle both the nursing home and assisted living industries and provide both forms of residential services. With further development of the residential continuum, nursing homes would increasingly concentrate on providing care to the more medically unstable, and perhaps the more physically aggressive, AD patients, whereas assisted living facilities could serve the more physically robust AD patients. This could potentially be attractive for both industries, as the payments for skilled nursing home care could be expected to be higher, perhaps resembling payments for subacute care, and assisted living facilities could benefit by serving a much larger long-term care market. Issues of resident transitions from assisted living to nursing home facilities remains a significant hurdle, and would appear to be best served by large providers offering both types of residential care. The one certainty for the future is the need for the continued expansion of residential settings for the inevitable increase in the number of AD patients.

References


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Appendix

Notes

1. Estimates from the 1995 National Nursing Home Survey indicated that only 10.9% of the nursing home admissions had reported diseases of the nervous system as their primary diagnosis at the time of admission (Dey, 1997). Although the percentage of dementia among new admissions implies that the actual number of nursing home residents with dementia should be lower than the reported 48%, the majority of new admissions enter nursing facilities for short stays as a result of episodes of acute illnesses or the need for rehabilitation. Dementia residents are primarily found among the long stay residents.

2. The Health Institute at the New England Medical Center conducted a psychometric analysis of the SF-36 data. Their conclusions indicated that the SF-36 physical health summary score obtained through interviews with formal caregivers serving as proxy respondents for AD patients were reliable measures of health related status, with relatively high internal consistency, good item discriminant validity, and high scale score reliability across all SF-36 subscales and across the SF-36 summary measures (see Leon, Neumann et al., 1998).

3. Donors from the MCBS were matched to sample AD patients using age, gender, race, marital status, income, and health status.

4. Unit cost for hospital days, emergency room visits, doctor visits, and prescribed medications, personal care, and homemaker services were derived from the 1994 MCBS data for beneficiaries identified as having AD. The daily cost for adult day care services came from the nation-wide surveys of adult day care programs for persons with dementia. For adult day care, average weekly use came from the national survey of adult day care programs for persons with dementia, Partners in Caregiving: The Dementia Services Program, a national program supported by the Robert Wood Johnson Foundation, with direction and technical assistance provided by the Bowman Gray School of Medicine of Wake Forest University. Service use estimates for personal care and homemaker services came from the 1994 Medicare Current Beneficiary Survey (MCBS) and its associated Medicare claim files covering AD patients. Unit costs for intermediate nursing home care came from the National Evaluation of Special Care Units Project, and unit costs for assisted living facilities came from a 1996 national survey of assisted living facilities (see U.S. Congress, General Accounting Office, 1997).

5. CPI cost adjusters were obtained from the HCFA, Health Care Financing Review (U.S. Department of Human Health and Services, 1997).