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Original Study

Trajectories Over the First Year of Long-Term Care Nursing Home Residence

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ABSTRACT

Objectives: To describe the trajectories in the first year after individuals are admitted to long-term care nursing homes.

Design: Retrospective cohort study.

Setting: US long-term care facilities.

Participants: Medicare fee-for-service beneficiaries newly admitted to long-term care nursing homes from July 1, 2012, to December 31, 2013 (N=535,202).

Measurements: Demographic characteristics were from Medicare data. Individual trajectories were conducted using the Minimum Data Set for determining long-term care stays and community discharge, and Medicare Provider and Analysis Reviews claims data for determining hospitalizations, skilled nursing facility stays, inpatient rehabilitation, long-term acute hospital and psychiatric hospital stays.

Results: The median length of stay in a long-term care nursing home over the 1 year following admission was 127 [interquartile range (IQR): 24, 356] days. The median length of stay in any institution was 158 (IQR: 38, 365). Residents experienced a mean of 2.1 ± 2.8 (standard deviation) transitions over the first year. The community discharge rate was 36.5% over the 1-year follow-up, with 20.8% discharged within 30 days and 31.2% discharged within 100 days. The mortality rate over the first year of nursing home residence was 35.0%, with 16.3% deaths within 100 days. At 12 months post long-term care admission, 36.9% of the cohort were in long-term care, 23.4% were in community, 4.7% were in acute care hospitals or other institutions, and 35.0% had died.

Conclusion: After a high initial community discharge rate, the majority of patients newly admitted to long-term care experienced multiple transitions while remaining institutionalized until death or the end of 1-year follow-up.

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Admission to a long-term care (LTC) nursing home represents a pivotal point in an individual's life, with institutionalization signifying a loss of independence. A common trajectory ending in LTC nursing home admission is hospitalization[1] followed by postacute care in a skilled nursing facility (SNF).[2] Individuals may transition from SNF to LTC services within the same facility, as nursing homes typically house both SNF "patients" and LTC "residents." SNF services are short-term and recuperative, whereas receipt of LTC services signifies a more permanent placement.[3]

A number of investigators have examined outcomes after admission to LTC.[1,4–6] Once in LTC, residents may be transferred to acute care hospitals or other institutional settings, such as SNFs, inpatient rehabilitation facilities, or psychiatric hospitals.[5] More than a quarter of residents are hospitalized within the first year.[1] Following hospitalization, residents often receive SNF services prior to returning to LTC.[7,8] These transfers to other levels of care are typically short-term, and a majority of residents return to LTC.[7] Approximately 20% of LTC residents are discharged to the community within a year of

admission.[3] Many will remain until death, and mortality rates of 12% to 34% have been reported over the first year of LTC nursing home residence.[1,9,10]

We took a different approach to describing outcomes among LTC residents. Rather than examine the rates of specific events, such as hospitalization, we attempted to describe the complete trajectory in the first year after individuals were admitted to LTC. To achieve this objective, we used a methodology developed by Intrator et al. to create residential history files for LTC nursing home residents.[11] Using their algorithm, we linked Medicare claims data and nursing home Minimum Data Set (MDS) assessment records to determine residents' setting for each day over their first year of residence.[11] Specifically, we determined daily whether the individual was (1) in an LTC nursing home, (2) in an acute care hospital, (3) in another institutional setting, (4) discharged to the community, or (5) dead. Understanding what happens to newly admitted LTC nursing home residents may provide insight into areas for care improvement. We describe the first year of LTC nursing home residence in a national sample of Medicare beneficiaries as a first step in answering these and other patient- and policy-relevant questions.

Methods

Data Sources

We used the 2012-2014 Medicare Beneficiary Summary files, Medicare Provider Analysis and Review (MedPAR) files, and Resident Assessment Instrument MDS 3.0 assessment files from the Centers for Medicare & Medicaid Services (CMS). The Beneficiary Summary files contain sociodemographic and monthly enrollment information. The MedPAR file contains finalized claims for all Medicare Part A inpatient stays, including those in acute care hospitals, SNFs, inpatient rehabilitation facilities, and psychiatric hospitals. The MDS files contain assessment records for SNF and LTC stays. Nursing homes typically house both patient populations. Medicare is the primary payer for SNF services and Medicaid is the primary payer for LTC services. Individuals are eligible for Medicare coverage if they are older than 65 years, disabled, or have end-stage renal disease.[12] Medicaid eligibility varies across states, but is typically available to individuals of all ages from low-income households.[12]

Study Cohort

The cohort was individuals newly admitted to an LTC nursing homes from July 1, 2012, through December 31, 2013. These individuals lived in the United States, had not resided in LTC over the prior 6 months, were over the age of 65 years at LTC admission, and had continuous Medicare Part A enrollment (no health maintenance organization) over the 6 months before and 12 months after LTC admission (N=535,202).

Resident Characteristics

We extracted residents' age, gender, and ethnicity from the Medicare Beneficiary Summary files and used the Medicaid indicator in the year of admission to LTC as a proxy of low socioeconomic status. We used diagnoses in the MedPAR files from all hospital admissions in the prior year to identify dementia status (yes/no) (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] codes 331.0, 331.11, 331.19, 331.7, 290.0, 290.10, 290.11, 290.12, 290.13, 290.20, 290.21, 290.3, 290.40, 290.41, 290.42, 290.43, 294.0, 294.10, 294.11, 294.8, 797) and Elixhauser comorbid conditions.[13] We used the admission MDS assessment from the patient's LTC stay to get information on marital status (married/unmarried), cognitive status (cognitively intact or mildly impaired/moderate or severely

impaired),[14] and physical functional status (6 activities of daily living [ADL] items). Tetrachoric or polychoric correlations were performed to measure the correlations between the functional status items.[15] The largest tetrachoric correlation between the functional items was 0.90. Because of this intercorrelation, we created a composite score (range 0-24) for functional status (higher scores indicating greater assistance with ADL).

Residence in Long-term Care

We identified LTC stays using the method developed by Intrator et al. in 2011.[11] This method uses claims data from the MedPAR files and assessment data from the MDS files to identify LTC stays. We identified SNF stays using claims in the MedPAR files. Any episodes in the MDS assessment files outside the dates of the SNF claims were considered LTC stays. We defined the start of an MDS episode as the entry date recorded in the assessment file and the end as the date of the last MDS assessment that listed the same entry date. We have validated this method of identifying LTC stays against Medicaid data, with 91% sensitivity and 87% positive predictive value.[16,17]

We followed the newly admitted LTC residents for 365 days or until death to create residential history files. We determined daily whether the individual was (1) in an LTC nursing home; (2) in an acute care hospital; (3) in another institutional setting, which we defined as SNF, inpatient rehabilitation facility, long-term acute care hospital, or psychiatric hospital; (4) discharged to the community; or (5) dead. We used MedPAR claims files to identify acute care hospital, SNF, inpatient rehabilitation facility, long-term acute care hospital, and psychiatric hospital stays. We defined community discharges as the discharge destination of the assessment was home or community.

Outcomes

We followed each resident to death or to 1 year after admission. We used the residential history files to determine the trajectory of each resident in the first year of LTC. We also determined length of stay in LTC over the 1 year following admission; days spent in any institutional setting; rates and timing of community discharge; and rates and timing of death.

Statistical Analysis

We described the first 4 transitions for all residents. To construct these trajectories, we calculated the percentage of residents transitioning to (1) an LTC nursing home, (2) an acute care hospital, (3) another institutional setting, (4) the community, or (5) death.

We calculated descriptive statistics for resident characteristics stratified by cognitive status (intact or mildly impaired/moderately or severely impaired), Medicaid eligibility (yes/no) and functional status (ADL ≤ 12/ADL > 12) to describe the cohort. We calculated length of stay in LTC nursing homes and days spent in any institutional setting over the first year of LTC residence. We also calculated both of these measures as functions of total days alive over the 1-year observation period. To examine survival and community discharge rates over the first year of LTC residence, we calculated Kaplan-Meier product limit estimators. We further used multilevel logistic models to assess state-level variation in rates of community discharge, adjusted for resident characteristics. All analyses were performed using SAS, version 9.4 (SAS Institute, Cary, NC).

Results

The final cohort included 535,202 residents who had previously lived in the community and who were newly admitted to an LTC