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Original Study

Transitions From Skilled Nursing Facility to Home: The Relationship of Early Outpatient Care to Hospital Readmission

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ABSTRACT

Background: Many adults are discharged to skilled nursing facilities (SNFs) prior to returning home from the hospital. Patient characteristics and factors that can help to prevent postdischarge adverse outcomes are poorly understood.
Objective: To identify whether early post–SNF discharge care reduces likelihood of 30-day hospital readmissions.
Design: Secondary data analysis using the Electronic Medical Record, Medicare, Medicaid and the Minimum Data Set.
Participants/setting: Older (age > 65 years), community-dwelling adults admitted to a safety net hospital in the Midwest for 3 or more nights and discharged home after an SNF stay ($n = 1543$).
Measurements: The primary outcome was hospital readmission within 30 days of SNF discharge. The primary independent variables were either a home health visit or an outpatient provider visit within a week of SNF discharge.
Results: Out of 8754 community-dwelling, hospitalized older adults, 3025 (34.6%) were discharged to an SNF, of whom 1543 (51.0%) returned home. Among the SNF to home group, a home health visit within a week of SNF discharge was associated with reduced hazard of 30-day hospital readmission [adjusted hazard ratio (aHR) 0.61, $P < .001$] but outpatient provider visits were not associated with reduced risk of hospital readmission (aHR $= 0.67$, $P = .821$).
Conclusion: For patients discharged from an SNF to home, the finding that a home health visit within a week of discharge is associated with reduced hazard of 30-day hospital readmissions suggests a potential avenue for intervention.

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Since 1990, there has been a dramatic rise in patients discharged from the hospital to a skilled nursing facility (SNF), from 20 million bed-days per year to more than 50 million.[1,2] This rise in SNF use has been accompanied by a decrease in hospital length of stay and an increase in the acuity of patients arriving in SNFs.[2,3] Community-dwelling older patients enter a familiar cycle when they become acutely ill that includes the following points of care (Figure 1): hospital admission, discharge to SNF, and eventual transition back home. Despite this common trajectory, there is very little evidence regarding the distinct patient characteristics, needs, and outcomes of this transition from an SNF to home.[2–4]

There is evidence that after a discharge from *hospital* to home, patients are at risk of adverse drug events, lost inpatient test results, social isolation, emergency department (ED) visits, and hospital readmissions.[5–7] Patients who are discharged home from SNFs are

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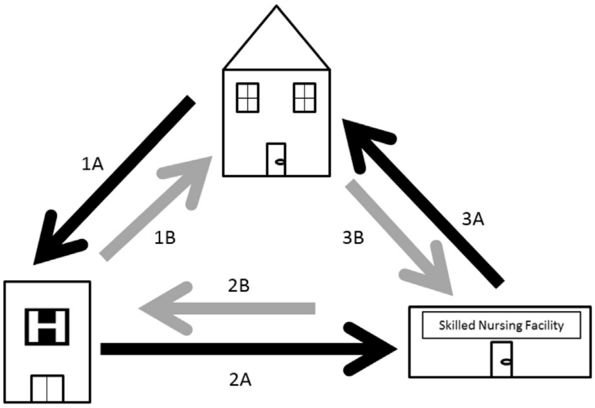

Fig. 1. Hospital to SNF to home trajectory. We describe 2 populations: (1) the Hospital to Home Group, which traverses arrow 1A followed by arrow 1B and, (2) the SNF to Home Group, which traverses arrows 1A, 2A, and 3A.

generally more vulnerable to poor outcomes than patients who are discharged directly home from hospitals, and thus are at higher risk of adverse outcomes.[3] However, little is known about the transition from SNF to home or the risk factors for adverse outcomes such as hospital readmission. Care in SNFs has come under amplified scrutiny as evidenced by Medicare rules to levy 30-day readmission penalties on SNFs.[8] Data are needed to identify both risk factors for adverse outcomes such as readmission and potential targets for intervention.

In the hospital to home literature, early outpatient follow-ups, such as early home health visits and early provider visits, have been identified as potential targets for intervention, yet the evidence for each intervention is mixed. Increased readmissions for post-hospital patients with primary care follow-up has been demonstrated in observational studies; however, other studies have demonstrated reduced ED visits and hospital admissions for patients who frequently use primary care.[9–11] The same conflicting results are seen in studies of home health interventions.[12–17] For example, one study found surgical patients discharged home with home health care were more likely to have a “nonsevere” readmission but not a “severe” readmission, with severe readmission being defined by whether or not an invasive procedure is performed during the readmission stay.[15] Another study of heart failure patients found that neither 1 week home health nor 1 week primary care visits were preventative of 30-day readmissions, but in combination, they significantly reduced the likelihood of hospital readmissions.[14]

Primary care follow-up within a week of SNF discharge is the recommended best practice by the American Geriatrics Society, the Society of General Internal Medicine, and AMDA—The Society for Post-Acute and Long Term Care.[18] Yet there is little empiric evidence for this approach for the SNF to home population, and few of the published interventions aimed at improving the SNF to home transition incorporate tactics that include partnering with outpatient care providers into their program.[19–21] We conducted a secondary data analysis to determine whether early outpatient follow-up is associated with hospital readmission. The primary hypothesis of our study is that patients who have early postdischarge care, here meaning an outpatient clinic visit or home health visit within a week of SNF discharge, will be less likely to return to the hospital within 30 days of SNF discharge.

Methods

Study Design

This is a secondary data analysis using the Older Adults Transition Study (OATS) database. The OATS database has been described elsewhere.[22,23] This database includes a cohort of 33,386 patients cared for at a safety net hospital in central Indiana. Eskenazi Health (formerly Wishard Memorial Hospital) includes a hospital plus 8 community health centers that primarily serve a vulnerable patient population in Indianapolis, IN. Older adults in the cohort were seen at Eskenazi Health during the study period between January 1, 2007, and October 1, 2010. The OATS database combines data from Medicare and Medicaid claims, the Minimum Data Set (MDS), Outcome and Assessment Information Set (OASIS), and Eskenazi’s local electronic medical records. These data enabled us to monitor patients’ transitions across settings of care over time. The Indiana University Institutional Review Board approved this study.

Patients

We identified Medicare or dual eligible (Medicare and Medicaid) enrollees who experienced an acute hospitalization of 3 nights or more and were then discharged home or to an SNF (Figure 2). Inclusion in the cohort was confirmed by matching the hospital discharge date to the SNF admission date. We excluded patients who died in the SNF, patients who did not enter the SNF directly from the hospital, and long-stay patients (>106 days based on a previous study[24]). We limited the eligible hospitalization period because of the change in MDS versions from 2.0 to 3.0 on October 1, 2010. OATS data were extracted 1 year prior and 1 year after the index hospitalization and SNF stay. All included patients had an SNF discharge date prior to October 1, 2010, the date MDS 3.0 was universally instituted with outcomes data through September 30, 2011.

Data Collection

Data extracted from the OATS database included demographic data, data on the degree of pre-hospitalization health care use, pre-SNF inpatient hospitalization characteristics, and postdischarge health care use. The MDS enabled collection of detailed data obtained while in the SNF, including in-SNF patient characteristics and common geriatric syndromes and conditions. Electronic medical record and Medicare billing diagnosis codes for common chronic comorbidities were also examined using lists of ICD-9 diagnosis codes from previous studies[22,25] Hospital admission diagnosis codes were grouped into the general systems-based categories; for example, diagnoses in the 400s were circulatory. We calculated the LACE Index using hospital admission claims data. A LACE score greater than 10 identifies patients who have a high likelihood of 30-day hospital readmission or mortality.[26]

The MDS and electronic medical record allowed for more detailed data than claims data alone, to be collected including in-SNF patient characteristics such as activities of daily living (ADL), and common geriatric syndromes such as sensory impairment, falls, medication, and weight. ADL scores were derived from MDS data using a 6-point scale, with higher scores indicating worse ADL functioning.[27] We used the MDS to quantify the use of potentially unsafe medications (antipsychotics, anxiolytics, and hypnotics). Polypharmacy was defined as 7 or more medications based on the least strict count from a panel of experts consensus via Delphi process.[28]

Our primary outcome variable, hospital readmission, was defined as readmission to an acute care hospital within 30 days of discharge from the SNF. We identified home health visits by using billing data from the OASIS home health data set, and we identified outpatient provider visits using CMS billing data. The providers may be specialists or generalists, physicians or advanced practitioners. In either case, we used the first date of either home health or an outpatient clinic visit to determine whether they occurred within a week of SNF discharge or later.

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