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Feature Article

Impact of frontloading of skilled nursing visits on the incidence of 30-day hospital readmission

Melissa O'Connor, PhD, MBA, RN, COS-C [a,*], Alexandra Hanlon, PhD [b], Kathryn H. Bowles, PhD, RN, FAAN, FACMI [c]

[a] College of Nursing, Villanova University, Villanova, PA, USA
[b] NewCourtland Center for Transitions and Health, School of Nursing, University of Pennsylvania, Philadelphia, PA, USA
[c] Center for Integrative Science in Aging, School of Nursing, University of Pennsylvania, Philadelphia, PA, USA

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A B S T R A C T

Hospitalization among older adults receiving skilled home health services continues to be prevalent. Frontloading of skilled nursing visits, defined as providing 60% of the planned skilled nursing visits within the first two weeks of home health episode, is one way home health agencies have attempted to reduce the need for readmission among this chronically ill population. This was a retrospective observational study using data from five Medicare-owned, national assessment and claim databases from 2009. An independent randomized sample of 4500 Medicare-reimbursed home health beneficiaries was included in the analyses. Propensity score analysis was used to reduce known confounding among covariates prior to the application of logistic analysis. Although whether skilled nursing visits were frontloaded or not was not a significant predictor of 30-day hospital readmission ($p = 0.977$), additional research is needed to refine frontloading and determine the type of patients who are most likely to benefit from it.

Introduction

Hospitalization among older adults receiving skilled home health services continues to be prevalent. Nationally, 27% of Medicare-reimbursed home health recipients are hospitalized at some point while receiving home health services.[1] Hospitalization costs in 2010 for fee-for-service Medicare beneficiaries rose to $116 billion from $113 billion in 2009 and $106 billion in 2005.[2] It has been estimated that unplanned, and possibly preventable, hospitalizations costs $12 billion a year and that eliminating just 5.2% of preventable Medicare readmissions could save an estimated $5 billion annually.[3]

While in its infancy, a growing body of evidence indicates that hospitalization among geriatric skilled home health recipients is most likely to occur within the first two weeks of the home health episode.[4–6] Specifically, the Home Health Quality Improvement Organization Support Center found, as reported by Vasquez, that among those hospitalized during the home health episode, 25% of patients are hospitalized within 7 days of admission to home health services[6]; 50.1% by 14 days[5]; and 58% by 21 days (cumulative).[6] These findings indicate the need to target services immediately following a hospital discharge and in the very beginning of the home health episode in order to reduce preventable readmissions.[7]

Like many other health care organizations in the United States, home health agencies and advocacy groups throughout the country have focused their efforts on reducing the need for 30-day hospital readmissions among Medicare beneficiaries. Frontloading of skilled nursing visits is one way home health agencies have attempted to reduce the need for readmission among this chronically ill population. Frontloading has been defined as providing 60% of the planned skilled nursing visits within the first 2 weeks of the home health episode.[8] Frontloading of skilled nursing visits is thought to allow clinicians to identify issues early-on and intervene before a readmission is needed. Results on the benefits of frontloading are particularly beneficial for those with heart failure decreasing readmission rates from 39.4% to 16%.[8] Conversely, the impact of frontloading was not effective for patients with diabetes.[8]

Despite limited evidence, frontloading for all diagnoses has been encouraged as one of 12 best practices aimed at reducing readmission among skilled home health recipients by the 2007 Home Health Quality Campaign (HHQC) and frontloading was also endorsed by the West Virginia Medical Institute.[4,9] The West

* Corresponding author.
E-mail address: melissa.oconnor@villanova.edu (M. O'Connor).

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Virginia Medical Institute is the Quality Improvement Organization, under contract with CMS, was charged with assisting health care providers in improving quality and safety and in developing innovative solutions that assure the quality and necessity of health care services.[10] To gain a better understanding of the benefits of frontloading, the purpose of this study was to evaluate the impact frontloading skilled home health nursing visits has on the incidence of 30-day hospital readmission among older adults receiving Medicare-reimbursed skilled home health services over a one-year period.

Frontloading of skilled nursing visits was operationalized by considering the findings of Bowles and colleagues who reported that, on average, skilled home health patients received nine skilled nursing visits during the home health episode.[11] Thus, five skilled nursing visits within the first 14 days of the home health episode were considered 60% of the total number of skilled nursing visits. We hypothesized that Medicare-reimbursed skilled home health recipients with frontloaded skilled nursing visits (5 or more skilled nursing visits in the first 14 days of the home health episode) would have a lower incidence of hospital readmission within 30-days of hospital discharge compared to those who received less than five skilled nursing visits within the first 14 days of the home health episode. It was hypothesized that client characteristics, including the hospitalization risk factors identified in the literature, home health agency tax identification status (for-profit vs. not-for-profit), and the intervention of frontloaded skilled home health nursing visits would impact 30-day readmissions to the hospital (Table 1). The covariates employed in this study were derived from a review of the literature as being associated with risk of readmission among skilled home health recipients.[7]

Theoretical framework

Mitchell and colleagues' Quality Health Outcomes Model (QHOM) guided this study (Fig. 1).[12] The QHOM is a theoretical framework that relates multiple factors affecting quality of care to desired outcomes and consists of four components: system, client, interventions, and outcomes. Given the heterogeneity of the Medicare-reimbursed skilled home health population, the model suggests that health interventions, specifically frontloaded skilled nursing following a hospitalization, influence and are affected by the client (hospitalization risk factors), to produce positive or negative outcomes (readmission within 30 days of hospital discharge). This study was grounded in the QHOM by conceptualizing and examining the relationships between system components and the impact these factors had on 30-day readmission.

Methods

Study design

This was a retrospective observational study using data from five Medicare-owned, national assessment and claim databases from 2009. Propensity score analysis was used to reduce known confounding among covariates. This study was approved using the expedited review procedure by the University's Institutional Review Board, Office of Regulatory Affairs.

Data sets

The 2009 assessment and claims data sets were obtained from CMS, through the Research Data Assistance Center (ResDAC). Data originated from a five-percent sample of the Outcome Assessment Information Set (OASIS), the home health assessment required for CMS beneficiaries, then cross-referenced to the home health and hospital claims, eligibility and provider files. The data sets were comprised of the following: OASIS-B1[13]; Home Health Standard Analytic File (HHSAF)[14]; Medicare Provider and Analysis Review File (MedPAR) (short stay/long stay/skilled nursing facility)[15]; Denominator/Eligibility File[16]; Provider of Services File (POS).[17] The data sets contained the covariates, independent and dependent variables, related to skilled Medicare home health beneficiaries and home health agencies essential to address the study aims. Table 1 contains the specific variables supplied by each data set.

Sample

Beneficiaries were eligible for the study if they were admitted to home health within 30 days of a hospital discharge. After applying the first seven of eight exclusions, 50,160 beneficiaries remained. Of these beneficiaries, 15.4% ($n = 7740$) experienced a 30-day hospital readmission. However, beneficiaries who were readmitted to the hospital within the first 14 days of home health ($n = 5268$) were excluded from the analysis because frontloading was not possible. After removing those readmitted within the first 14 days, 44,892 eligible home health beneficiaries remained in the data set. Overall there were eight exclusion criteria applied to the data sets (Fig. 2). The remaining home health beneficiaries were divided into two

Table 1
Data sources.

Variable type (QHOM concept)	Variable	Variable definition	Variable source
Independent (intervention)	Presence of front-loaded skilled nursing visits	5 or more skilled nursing visits in the first 14 days of the home health episode	Home Health Standard Analytic File (HHSAF)
Dependent (outcome)	30-day hospital readmission	The occurrence of a hospital readmission within 30-days of a hospital discharge for CMS-reimbursed patients receiving HH services	Medicare Provider and Analysis Review File (MedPAR)
Covariates (client)	Female, White, Hispanic, severity of illness, living alone, guarded rehabilitation prognosis, pressure ulcer, stasis ulcer, dyspnea, urinary incontinence, lacking an informal caregiver, needing assistance with bathing, ambulation, eating or taking medications	Hospitalization risk factors	Outcome Assessment Information Set (OASIS)
Covariates (client)	Diagnosis of DM, depression, ischemic heart disease, HIV/AIDS, renal failure, HF, COPD, cardiomyopathy, dysrythmia, CAD, Alzheimer's disease, personality/anxiety disorders, osteoporosis, MI; presence of 4 or more diagnoses	Hospitalization risk factors	HH Agency Standard Analytic File (HHSAF)
Covariate (system)	Seen by a for-profit home health agency	Hospitalization risk factor	Provider of Services File