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Brief Reports

SURVEY AND CHART REVIEW TO ESTIMATE MEDICARE COST SAVINGS FOR HOME HEALTH AS AN ALTERNATIVE TO HOSPITAL ADMISSION FOLLOWING EMERGENCY DEPARTMENT TREATMENT

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☐ **Abstract—Background: Almost 70% of hospital admissions for Medicare beneficiaries originate in the emergency department (ED). Research suggests that some of these patients' needs may be better met through home-based care options after evaluation and treatment in the ED. Objective: We sought to estimate Medicare cost savings resulting from using the Home Health benefit to provide treatment, when appropriate, as an alternative to inpatient admission from the ED. Methods: This is a prospective study of patients admitted from the ED. A survey tool was used to query both emergency physicians (EPs) and patient medical record data to identify potential candidates and treatments for home-based care alternatives. Patient preferences were also surveyed. Cost savings were estimated by developing a model of Medicare Home Health to serve as a counterpart to the actual hospital-based care. Results: EPs identified 40% of the admitted patients included in the study as candidates for home-based care. The top three major diagnostic categories included diseases and disorders of the respiratory system, digestive system, and skin. Services included intravenous hydration, intravenous antibiotics, and laboratory testing. The average estimated cost savings between the Medicare inpatient reimbursement and the Home Health counterpart was approximately $4000. Of the candidate patients surveyed, 79% indicated a preference for home-based care after treatment in the ED. Conclusions: Some Medicare beneficiaries could be referred to Home Health from the ED with a concomitant reduction in Medicare expenditures. Additional studies are needed to compare outcomes, develop the logistical pathways, and analyze infrastructure costs and incentives to enable Medicare Home Health options from the ED.**

☐ **Keywords—cost; emergency department; home health; hospital admission**

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INTRODUCTION

Inpatient medical care accounts for approximately 29% of total medical expenditures in the United States, and it is important to consider the emergency department (ED) and its emerging role as a gateway to inpatient hospital care, especially as it pertains to Medicare beneficiaries (1,2). Specifically, almost 70% of admissions for Medicare beneficiaries originate in the ED (1,3). Most health systems do not presently support easy access to ED-based outpatient treatment options that could reduce inpatient admissions (4). Of the 19.3 million ED visits that resulted in hospitalization in 2011, 52% were

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Medicare beneficiaries, some of whom faced significant risks for delirium, nosocomial infections, and falls (3,4). The development of health service innovations that provide home-based alternatives after treatment in the ED may reduce the incidence of these hospital-based complications while simultaneously allowing patients to be cared for in the comfort and safety of their own homes. A prospective survey-based study was conducted to understand the cost implications associated with the development of such home-based care options from the ED.

IMPORTANCE

In 2015, the Department of Health and Human Services (HHS) announced explicit goals pertaining to alternative payment models and value-based payments (5). Many of these payment models build on traditional Medicare fee-for-service benefits while incentivizing providers to consider resource utilization levels and to assume financial risk to develop health service innovations that achieve high quality care better matched to the needs of seniors.

The Medicare Home Health benefit presently covers certain home-based skilled medical services carried out in accordance with a plan of care signed by a supervising physician. The physician must certify that the beneficiary has both a specific medical need and is homebound. However, compared to the relative ease of recommending inpatient admission, ordering Home Health from the ED may be more complex and time-consuming. Physician hand-off from the emergency physician (EP) to the patient's primary care physician (or other medical supervisory care) may also be difficult. Finally, Home Health agencies may not currently meet the faster response times needed to address patient needs after ED treatment. Because providers may need to assume financial risk and invest in infrastructure to overcome these types of challenges, it is critical to first understand the cost implications of this alternative treatment approach, beginning from the perspective of Medicare expenditures.

OBJECTIVE

The objective of this study was to understand both patient and clinical acceptance and cost implications associated with using the Home Health Medicare benefit as an alternative to inpatient admission after ED treatment. To that end, the study first characterized patient acceptance and patient care pathways (treatments) identified by EPs as being appropriate for home-based care referral. The study then used these characterizations as a basis to estimate hypothetical Home Health costs and savings.

MATERIALS AND METHODS

Study Design and Setting

A prospective study was conducted that comprised of a survey of both attending EPs and patients with initial orders for admission to medical units from two EDs. The EDs used in the study were part of an academic health system with two hospitals and a combined annual census of 75,000 patients. One hospital was an urban, academic teaching hospital (a level 1 trauma center) and the other was a suburban community hospital. Patients included English-speaking adults ≥18 years of age who had no orders for telemetry. Patient recruitment took place intermittently from September 2014 to March 2015 to generate a convenience sample. For each recruited patient, physician recruitment was limited to the EP attending (i.e., residents and interns were excluded). This study was approved by the teaching hospital's institutional review board.

DATA COLLECTION AND PROCESSING

Measures and procedures

A first survey tool was used to query patients with initial orders to be admitted to the hospital from the ED in order to determine their potential preference for a home-base alternative care, if it were to be made available. A second survey tool was used to query the EP attending to determine whether the patient could be a candidate for home-based care, also if it were to be made available as an alternative to inpatient admission. For each candidate, medical record data were queried to characterize both the ED and inpatient episodes of care. The study was not limited to Medicare beneficiaries.

Medicare cost savings were estimated by calculating prospective payments for both actual inpatient hospital costs and hypothetical alternatives of Home Health. In the case of inpatient care, the prospective payments were determined by the Medicare Services Diagnostic Related Group (MS-DRG) designated in the health record. These identified MS-DRGs were also mapped into the corresponding major diagnostic categories (MDCs).

To model the Home Health alternative, prospective payments were estimated based on designated Home Health–related groups (HHRGs). Specifically, medical skilled care services provided during the inpatient episode of care were identified using both the queried ED and inpatient records. Functional status and service needs were also estimated. These assessments (i.e., medical, functional, and service) were then used to complete pertinent line items in the Medicare Outcomes and Assessment Information Set. Medicare Outcomes and

Assessment Information Set data were then used to determine estimated county-wide HHRG payments for equivalent early-episode home health services.

It is important to note that the HHRG payment does not cover all nonphysician services that may have been provided in the hospital. In particular, while costs for medications, laboratory, imaging, and durable medical equipment are all folded into the MS-DRG, they are not included in HHRG payments, so additional charges must be considered before performing the MS-DRG/HHRG comparison. To include these additional charges in the overall comparison, adjusted HHRG payments were derived using the standard U.S.-wide Medicare 5% dataset for each of the HHRGs to obtain an adjustment multiplier reflective of average additional costs for medications, laboratory, and imaging services. These adjusted HHRGs were then compared to the county-wide average MS-DRG payments for each patient to arrive at the estimated cost savings.

RESULTS

Characteristics of Study Subjects

The EPs surveyed in the study identified 25 of 63 patients with preliminary orders (40%) as potential candidates for Home Health instead of admission, had the Home Health option been available. Of these 25 patients selected, four patients either declined admission or were subsequently discharged despite having preliminary admission orders. No additional data were available pertaining to these four discharged patients, so they were excluded from subsequent analysis. Two other patients were excluded from subsequent analyses because no MS-DRG was designated at the time of review.

Main Results

Of the 19 patients designated by the surveyed attending EPs to be included in the analysis, 12 MS-DRGs mapped to the same set of three MDCs: MDC 4, "Diseases and Disorders (DDs) of the Respiratory System" (2 white males, 2 white females; average age 57 years); MDC 6, "DDs of the Digestive System" (1 Hispanic female, 1 Hispanic male, 1 African-American male, 1 white male, 1 multiracial male; average age, 38 years); and MDC9, "DDs of the Skin, Subcutaneous Tissue and Breast" (1 white male, 2 white females; average age 55 years). EP-designated services needed to enable home-based care included intravenous antibiotic therapy, intravenous hydration, and laboratory analysis. For the patients enrolled in the study, the difference between the MS-DRG reimbursement and the adjusted HHRG payments ranged from $1828 to $9857, with a median difference of $2957 and an interquartile range of $2692. The average difference was $4144. Of the 19 patients included in the analysis, 15 indicated that they would have preferred to have their health care at home.

DISCUSSION

Currently, most provider systems offer only three options after ED treatment: admit, discharge, or observe. However, this study suggests that 1) patients and providers would be accepting of home-based treatment options and 2) such options could be provided at lower levels of Medicare expenditure.

Limitations

The cost implications analyzed for the present study were limited to estimates of Medicare expenditures—provider investments and incentives to develop infrastructure necessary to realize these savings were not considered. In addition, the patient enrollment for the study was not limited to Medicare beneficiaries, so the study does not provide a basis for inferring actual numbers or percentages of Medicare beneficiaries. Because the study did not involve an actual home-based treatment arm, outcomes are not available and Medicare expenditures associated with possible additional outpatient costs (e.g., office visits or return ED visits) were not reflected in the estimates. There is a risk that the intermittency of patient recruitment over the 7-month time frame could have introduced a convenience bias into the patient pool and their appropriateness for home-based options.

There are limitations to the methodology of comparing MS-DRG and HHRG payments to estimate care cost savings associated with ED-based referrals to Home Health as an alternative to inpatient hospital care. Specifically, the inpatient MS-DRG is mainly diagnosis and severity-based, while the comparison HHRG payment is based more on service needs. The MS-DRGs could be slightly underestimated because they do not include common adjustments, such as graduate medical education, disproportionate share hospital status, and the like. Other limitations of the comparison include the fact the HHRG-estimated payments were constructed based on the total care received in the inpatient counterpart, including the ED-based component of care. For the Medicare beneficiaries, ED-based care is combined into the inpatient MS-DRG payment for those patients

admitted from the ED. For a patient receiving Home Health after ED treatment, the ED-based portion is separated, so there would be an additional ED facility fee. However, the actual HHRG payment would then be lower than the estimates used in the study, because the actual HHRG would not include the ED portion of care. Differences in physician fees were not considered, nor were actual costs associated with providing new infrastructure or process-related changes needed to support the Home Health option from the ED.

CONCLUSIONS

This study suggests that EPs would designate certain patient cohorts for Home Health as an alternative to admission after ED treatment and that the concomitant Medicare cost savings would be substantial for this alternative. The survey supports follow-on studies involving the actual provision of home-based care from the ED, both to compare outcomes and to provide a basis for analysis of incentives and investment needed to develop logistics, technology, and infrastructure for ED-based home care referral options.

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ARTICLE SUMMARY

1. Why is this topic important?

Emerging value-based payment models are expected to incentivize provider systems to develop more home-based care alternatives to hospital-based care, including care originating in the emergency department (ED). Providers may need to assume financial risk to develop these alternatives, and it is important to first understand the cost implications, especially from the perspective of Medicare expenditures.

2. What does this study attempt to show?

The study attempts to estimate the cost savings associated with using Medicare Home Health as an alternative to inpatient admission after ED treatment. The study also attempts to characterize patient acceptance and treatments identified by emergency physicians as being appropriate for home-based care referral.

3. What are the key findings?

For the patients included in the study analysis, the average reimbursement difference between the hospital and Home Health alternative was estimated to be $4144. Emergency physician–designated services included intravenous antibiotic therapy, intravenous hydration, and laboratory analysis. Of the 19 patients included in the analysis, 15 indicated that they would have preferred to have their health care at home.

4. How is patient care impacted?

There is potential to reduce the incidence of "default" inpatient admissions originating from the ED, which may in turn reduce the incidence of hospital-based complications while simultaneously allowing patients to be cared for in the comfort and safety of their own homes.