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Original Contribution

The cost of observation care for commercially insured patients visiting the emergency department☆

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ABSTRACT

Objective: To examine trends in the use of ED observation stays among a national sample of patients with commercial insurance, and assess the patient cost-burden of an observation stay relative to an short inpatient hospitalization from the ED.

Methods: Retrospective analysis of ED observation stays and inpatient hospitalizations from 2008 to 2015 using the Truven MarketScan® Commercial Claims and Encounters database. Index ED visits were identified from claims files and assessed for evidence of an observation or inpatient hospitalization. Total and out-of-pocket costs were calculated for the index hospitalization and a 30-day episode of care and standardized to 2015 $USD. Costs for ED patients with an observation stay were compared to a similar, propensity-matched cohort of ED patients hospitalized as inpatients.

Results: Over the 8 year period, observation stay admissions increased from 4.3% to 6.8% of total ED visits (60.5% relative increase) while inpatient admissions fell from 10.8% to 8.9% (16.6% relative decrease). In 2015, the mean total cost was $8162 for an observation stay and $22,865 for an inpatient hospitalization. Patient out-of-pocket costs were $962 and $1403, respectively. Among the propensity-matched cohorts, relative mean costs for the index hospitalization were 41% higher and patient out-of-pocket costs were 33% higher if the patient was admitted as an inpatient from the ED versus observation during their hospitalization.

Conclusions: Observation hospitalizations are an increasingly common disposition for patients entering the hospital through the ED. Both total and patient out-of-pocket costs are lower, on average, for an observation stay compared with a similar inpatient admission for ED patients requiring hospitalization.

1. Introduction

The use of observation for patients requiring acute, unscheduled hospital care has expanded dramatically in the past decade [1-6]. This trend largely reflects hospitals' substitution of outpatient observation stays for short inpatient hospitalizations, which have been discouraged by Centers for Medicare and Medicaid Services (CMS) and other payers [7]. Currently, limited guidance exists for providers—including the CMS's 2-Midnight Rule—around which patients should be admitted to the hospital as inpatients versus hospitalized as outpatients under observation. Not surprisingly, substantial variation in provider and hospital observation practices exists [8-13].

Shifting reimbursement policies around inpatient care have important financial implications for patients. Approximately 6% of Medicare patients admitted to observation will have hospital stays that cost them more out-of-pocket than an inpatient admission [14]. By contrast, in the VA, for any patient subject to cost-sharing, an observation stay is much less expensive than an inpatient admission [3]. However, the cost of observation stays for patients with commercial insurance, for which patient cost exposure and utilization patters differ, has not been well studied. Of the recent studies examining trends in the use of observation stays among individuals with commercial insurance, they either did not address costs related to those observation stays [5,6], or focused the cost assessment to a limited set of clinical conditions [15].

In this study we used a nationally representative dataset to assess recent trends in observation care among commercially insured patients visiting the ED. We aimed to calculate the costs associated with these

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unscheduled observation stays and determine the extent to which they place patients at risk for greater out-of-pocket costs relative to inpatient admission.

2. Methods

2.1. Data source

We conducted a retrospective analysis of adult patients who visited the ED in 2008–2015 using Truven Health Analytics MarketScan® Commercial Claims and Encounters (CC&E) [16]. The MarketScan CC&E is a nationally-representative dataset containing patient-level claims and hospital discharge data that captures complete episodes of care (longitudinal ED, inpatient, outpatient and pharmacy records) for >50 million beneficiaries with employer-sponsored health plans per year.

2.2. Cohort identification

We identified index ED visits from outpatient claims that had either an ED revenue code of 450-459, an ED CPT code of 99281-99285, or place of service listed as ED. To be counted as an index visit, the beneficiary must not have had an ED visit or hospitalization in the past 30 days. ED visits resulting in inpatient hospitalization were identified by linking inpatient claims having an admission date within 1 day of an index ED visit or a source of admission listed as the ED. Hospital observation stays were identified from outpatient claims using the following criteria: observation stay revenue code of 0760 or 0762, observation stay CPT code of 99218-99220 (initial observation care), 99234-99236 (same day observation admission and discharge codes), or 99224-99226 (subsequent observation care). A unique patient with the first occurrence of an observation claim within 1 day from an index ED visit was considered to have been placed in observation from the ED. To capture prolonged observation stays, we searched for evidence of observation services extending 10 days from an index visit and aggregated observation claims occurring on consecutive days. The first day without evidence of observation services or consecutive observation services followed by an inpatient admission or new ED visit was considered to be the end of the observation period.

A minority of patients admitted to observation from an ED visit will fail to improve and require subsequent inpatient admission (hereinafter 'observation failure'). To identify observation failures, we linked inpatient claims to the preceding index ED visit for patients who were flagged as having an ED observation stay and also had observation claims on consecutive days leading up to an inpatient admission.

2.3. Calculation of costs

We examined both total and out-of-pocket costs for a) the index hospitalization and b) the 30-day episode-of-care. Costs were estimated from the payer perspective using hospital reimbursement data. Hospital costs were calculated by aggregating outpatient and inpatient payments for all service claims associated with an index ED visit plus any subsequent observation stays and inpatient admissions. Total hospital costs included both the insurer and patient portion of reimbursements. Out-of-pocket costs included the portion of total payments made to providers from patient co-insurance, co-payments and deductibles. Thirty-day episode costs were assessed by aggregating payments for all outpatient and inpatient claims beginning on the date of discharge from the hospital or last day of consecutive observation services. We included 30-day episode costs to capture any services that may be shifted to the ambulatory setting for patients with short observation stays, and also reflect any differences in unplanned returns to the hospital that might exist between the groups. All costs are reported in 2015 $USD.

2.4. Statistical analysis

Due to the size of the multi-year dataset, we used a 5% random sample of index ED visits as our analytic cohort. The proportion of ED visits resulting in an inpatient hospitalization or observation stay were calculated for each study year and trends described. Descriptive statistics were compared for ED visits resulting in an observation stay with discharge, observation failure, and inpatient admission.

To understand the patient cost-burden of an observation stay, we compared costs for ED patients hospitalized to observation at the conclusion of their visit compared with a similar, propensity-matched cohort of patients hospitalized as inpatients using nearest neighbor matching with replacement (maximum radius of <0.01). Since it is not known which patients will fail observation at the time the initial decision to observe or admit is made, for the purposes of analysis we include observation failures in the observation stay group. In this way, we analyze data from these cross-over patients in the first treatment group they were assigned to. This approach will produce more conservative estimates of the average treatment effect of admission to observation versus inpatient. We report differences in mean costs across the groups. Although healthcare costs tend to be very skewed by a small number of resource intense patients, we assessed for the presence of any influential observations that appeared to be driving the mean costs after conditioning on the covariates using Cook's distance. Cook's distance was near 0 for each of the observations suggesting our results were not influenced by a small number of observations.

To create the propensity score, a logistic regression model was used to predict the likelihood of admission to observation versus inpatient for all patients who remained in the hospital after their ED evaluation. Variables included in the propensity score model were: age, gender, Elixhauser comorbidities [17], and healthcare utilization variables (total number of ED visits, hospitalizations, outpatient visits, and unique prescription medications in the prior year), and hospital length of stay (LOS; dichotomized as a short hospital stay ≤2 days versus >2 days), including all squares of variables and possible interactions between variables. To ensure similarity of diagnostic mix, indicators for the top 50 most common observation diagnoses as grouped by Clinical Classification Software (CCS) were also included in the final model [18]. Finally, we generated inverse probability weights on the matched cohort using a second regression to account for any residual imbalances in covariates in the assessment of cost.

Variable means of observation stays versus inpatient admissions, and the standardized mean difference (SMD) between groups are reported in Table A1 (Supplementary Appendix) for the unmatched and matched cohorts, as well as represented graphically in Fig. A1. The covariates were well balanced after propensity matching and weighted adjustment for residual imbalances. In addition to the main analysis presenting cost differences across the entire matched cohort of hospitalizations, we performed a sensitivity analysis examining cost differences for the subgroup of matched hospitalizations ≤2 days in length of stay. The cost-differences observed after limiting the analysis to only to short stay admissions were similar to those reported for the total population (Table A2).

3. Results

3.1. Characteristics of study population

There were 2,267,909 index ED visits available for analysis. The proportion of these visits by patient disposition is shown in Fig. 1. Selected characteristics of the unmatched study population are listed in Table 1. Compared to inpatients, patients with observation stays were more likely to be female, have fewer comorbidities, and take fewer prescription medications. They also had fewer baseline ED visits, hospitalizations, and outpatient visits. Patients who failed observation had characteristics that more closely resembled inpatients.