

30-Day Episode Payments and Heart Failure Outcomes Among Medicare Beneficiaries

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ABSTRACT

OBJECTIVES The purpose of this study was to examine the association of 30-day payments for an episode of heart failure (HF) care at the hospital level with patient outcomes.

BACKGROUND There is increased focus among policymakers on improving value for HF care, given its rising prevalence and associated financial burden in the United States; however, little is known about the relationship between payments and mortality for a 30-day episode of HF care.

METHODS Using Medicare claims data for all fee-for-service beneficiaries hospitalized for HF between July 1, 2011, and June 30, 2014, we examined the association between 30-day Medicare payments at the hospital level (beginning with a hospital admission for HF and across multiple settings following discharge) and patient 30-day mortality using mixed-effect logistic regression models.

RESULTS We included 1,343,792 patients hospitalized for HF across 2,948 hospitals. Mean hospital-level 30-day Medicare payments per beneficiary were \$15,423 ± \$1,523. Overall observed mortality in the cohort was 11.3%. Higher hospital-level 30-day payments were associated with lower patient mortality after adjustment for patient characteristics (odds ratio per \$1,000 increase in payments: 0.961; 95% confidence interval [CI]: 0.954 to 0.967). This relationship was slightly attenuated after accounting for hospital characteristics and HF volume, but remained significant (odds ratio per \$1,000 increase: 0.968; 95% CI: 0.962 to 0.975). Additional adjustment for potential mediating factors, including cardiac service capability and post-acute service use, did not significantly affect the relationship.

CONCLUSIONS Higher hospital-level 30-day episode payments were associated with lower patient mortality following a hospitalization for HF. This has implications for policies that incentivize reduction in payments without considering value. Further investigation is needed to understand the mechanisms that underlie this relationship. (J Am Coll Cardiol HF 2018;■:■-■) © 2018 by the American College of Cardiology Foundation.

There is increased focus among policymakers on improving value for heart failure (HF) care, given the high and rising prevalence of HF and its associated financial burden in the United States (1). HF is the most common cause of hospitalization among Medicare beneficiaries and accounts for a large portion of total Medicare expenditures (2,3); however, mortality rates remain high, and improvements have slowed in recent years (4). To incent ongoing progress in both costs and outcomes of

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**ABBREVIATIONS
AND ACRONYMS****CI** = confidence interval**CMS** = Centers for Medicare
and Medicaid Services**HF** = heart failure**HVBP** = Hospital Value-Based
Purchasing Program**PCI** = percutaneous coronary
intervention**SNF** = skilled nursing facility

care, the Centers for Medicare and Medicaid Services (CMS), through the mandatory Hospital Value-based Purchasing (HVBP) program, financially rewards or penalizes hospitals based on performance on both mortality and payment measures for HF as well as other common conditions (5).

As value-based and alternative payment models increasingly spur hospitals to both reduce spending and improve outcomes for HF, it is important to understand how payments for an episode of HF care are related to clinical outcomes. Prior studies have demonstrated significant variation in payments associated with HF hospitalizations in the United States (6-8); however, little is known about whether higher payments are associated with better outcomes, which would at least potentially indicate high value, or whether higher payments are associated with worse outcomes, which would indicate poor value. The relationship is unclear, in part, because little is known about how higher payments might translate into actual care delivery. Higher payments may reflect the overuse of low-value resources or use of unnecessary post-acute care, which would not have a positive effect on outcomes. Alternatively, high payments may be driven by the use of resources and services that actually improve quality of care and survival. Given that for hospitals participating in HVBP, episode payment metrics together with 30-day mortality metrics account for one-half of a total score used by CMS to evaluate performance (and determine financial rewards or penalties), understanding the relationship between these measures for an episode of HF care is increasingly important and policy-relevant (5).

Therefore, in this study, we aimed to answer several questions. First, how do hospitals whose patients with HF incur high 30-day Medicare episode payments, reflecting both hospital-based and outpatient care in the immediate post-discharge time frame, differ from those with low episode payments? Second, are higher hospital-level 30-day episode payments for HF care, beginning with a hospital admission for HF and across multiple care settings following discharge, associated with lower patient-level mortality? And if so, to what extent do differences in hospital characteristics, cardiac service capability, and post-acute service use explain the association?

METHODS

PATIENT COHORT. Eligible patients were fee-for-service Medicare beneficiaries aged 65 years or older hospitalized at an acute care hospital for HF based on

principal discharge diagnosis codes from the International Classification of Diseases-9th Revision from July 1, 2011, through June 30, 2014. Patient characteristics included age, sex, and comorbidities that were defined based on a validated administrative claims model used to profile hospital 30-day mortality measures for HF (9). We applied inclusion criteria previously used by CMS for HF mortality rate measures. For patients with more than 1 HF admission across the 3-year period, only 1 randomly selected episode of care was included (7,9,10).

30-DAY EPISODE PAYMENTS FOR HEART FAILURE.

Hospital-level risk-standardized payments for a 30-day episode of HF care (which from this point on will be referred to as episode payments), a measure made publicly available by CMS on Hospital Compare, were used to characterize payments across a 30-day period beginning with a hospital admission for HF (7,8). Episode payments reflect variations in hospital practice patterns and resource use related to HF care and are calculated by summing total payments associated with a 30-day episode of HF care for each beneficiary, beginning with index admission and across multiple care settings, services, and supplies (i.e., inpatient, outpatient, skilled nursing facility [SNF], home health, physician/clinical laboratory/ambulance services, durable medical equipment). In addition to inpatient payments, post-acute payments are attributed to the hospital of index HF admission because care and discharge planning during a hospitalization influences subsequent expenditures across care settings. Geographic differences and policy adjustments (i.e., for costs of living, graduate medical education, and disproportionate share hospitals) in Medicare payment rates are accounted for. Additionally, episode payments are risk-adjusted for differences in patient characteristics and hospital case mix and account for clustering of patients within hospitals. For patients transferred from 1 acute care hospital to another, total payments across 30 days are attributed to the first hospital where the patient was admitted (7). Hospitals in the Inpatient Prospective Payment System with too few HF cases (<25) were not included in the analysis. Hospital payment performance is assessed over a rolling 3-year period; here, we used performance data representing July 1, 2011, to June 30, 2014, which were used in the HVBP program in fiscal year 2016 (7).

We used episode payments because they represent health care expenditures from a payer's (Medicare) perspective, and reflect a hospital's style of practice in terms of the level of use of resources and services by their patients with HF; for example, some

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