In this issue of the Journal, Dunlay et al. (1) assessed the frequency, reasons, and risk factors for hospitalizations in patients with heart failure (HF). The work is unique because they assessed the lifetime burden of hospitalizations in a population-based cohort of incident HF identified by diagnosis, not from time of HF hospitalization, which has previously dominated our research and understanding. An additional strength is the high rate of characterization of ejection fraction. Placing this article in the context of previous studies highlights the crucial importance of 2 distinctions: 1) many hospitalizations in patients with HF are not “HF hospitalizations;” and 2) the number of hospitalizations is higher than the number of patients hospitalized, due to the “frequent flyer” cohort.

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Frequency and Reasons for Hospitalizations

Population studies have demonstrated that hospitalizations in HF patients are frequent, and many are due to non-HF reasons. The current study found that 83% (895) of patients diagnosed with heart failure had at least 1 hospitalization, resulting in a total of 4,359 hospitalizations over a mean follow-up of 4.7 years. However, only 17% (713) of these hospitalizations were attributed to HF, and these clustered among 32% of the patients (1). This provides a longer view than a previous 1-year study of Medicare patients identified by HF diagnosis, of whom 59% had hospitalizations in 1 year, with 24% due to HF (2).

Most studies instead begin tracking after a HF hospitalization (≥1 HF hospitalizations) and show a high rate of early rehospitalizations (3–5) (Table 1), of which about two-thirds are attributed to cardiovascular (CV) causes (3). When we focus on those with a first hospitalization for HF, 1-year rehospitalization was still common: 69% for any reason (4), 44% to 50% for CV reasons (4,5), and 14% to 30% for HF (4–6). In patients with ≥2 HF hospitalizations, further analyses from the previous report of hospitalizations in British Columbia demonstrate that the overall rehospitalization rate was similar (60% in 1 year) (4). Almost all rehospitalizations were for cardiovascular reasons (96%), and many were due to HF (60%). Considering the difference in the criteria of patient identification between the current and previous studies, these data confirm that patients identified by hospitalization for HF have a higher risk of repeated hospitalizations and that multiple HF hospitalizations are clustered within these patients.

Predicting Hospitalizations

The current study showed that male sex, diabetes, chronic pulmonary disease, anemia, and renal dysfunction predict hospitalization for any reason (1). Previous studies found that advanced age (3,7,8), noncardiac comorbidities such as chronic kidney disease (3,7,8), chronic pulmonary disease (3,7), diabetes (7), depression (7), and prior hospitalizations (3,8) predict all-cause hospitalizations. We found that the association between repeated hospitalizations and mortality was attenuated by advanced age and chronic kidney disease, indirectly suggesting that these factors predict repeated HF hospitalizations (4). The risk of hospitalization was similar in patients with and without systolic dysfunction (1,6).

Mortality After Hospitalizations

History of an HF hospitalization, the number of HF hospitalizations, and shorter time to HF hospitalization are all associated with high mortality in trial patients (9,10). In community patients with HF, the mortality significantly increased after each HF hospitalization (4), which is similar in HF with and without systolic dysfunction (5). The data on non-HF hospitalizations are conflicting: 1 large population-based study found that mortality is increased by repeated hospitalizations if due to HF or myocardial infarction, but not other CV diagnoses (4), whereas another experience found a similar effect on mortality after rehospitalization for any CV diagnoses (5). Hospitalizations in patients with HF may serve as markers for disease progression, may reflect limited patient and health care system capacity, or may themselves increase mortality due to the impact of rapid and aggressive therapies to reverse decompensation (11,12).
Reducing the Burden of Hospitalizations

Patients with HF account for about one-tenth of the Medicare population but over one-third of all Medicare spending, presenting an unsustainable burden as the population ages. The Get With The Guidelines program from the American Heart Association focuses on translating HF therapies from major trials into routine hospital practice, and serves as 1 example of a range of interventions to improve outcomes through the H2H (hospital to home) transition advocated by the American College of Cardiology. However, the goal of decreasing HF admissions is hindered by uncoupled systems for in-hospital and outpatient management, where care is fragmented between multiple providers.

The current study underlines the need to look through the haze of the hospital burden at the “who” and “why” of hospitalizations and recognize 2 groups of patients. Patients who carry a diagnosis of HF without previous HF hospitalization are more likely to be hospitalized for conditions that are not HF. Surely, interventions should differ in the patient group defined by recent HF hospitalization for whom the likelihood of HF as the next admission diagnosis rises after each readmission (Table 1). It is likely that hospitals will move to shoulder some of the clinical and financial burden of transition care during the month after discharge for these patients at highest risk of HF readmissions.

This study reminds us that care should be tailored to fit goals and risks for individual patients, not for diagnoses or for the specialists who treat them. The comorbidities that drive many hospitalizations in general communities are exclusions for most trials from which our bases of evidence derive. It is not entirely certain that the promised benefits of hospitalization reduction are realized when recommended therapies are prescribed in the real world for patients with HF as one of multiple diagnoses.

As we have advanced successfully from the anecdote to the bases of evidence, some vital information has perhaps been lost in the transition from individuals to averages. The cluster of patients with accelerating hospitalizations merits specific re-evaluation of recommended therapies and timing of discussion regarding patient preferences near the end of the journey. Care for the whole patient remains more than the sum of recommended therapies for separate diagnoses. “Who” and “why” will always be important questions.

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## REFERENCES


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