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Commentary

There Must Be a Better Way

Piloting Alternate Routes Around Heart Failure Hospitalizations

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The need for hospitalization is a sentinel event in the life of a patient with heart failure (1,2). Within 30 days of hospital admission with heart failure, nearly 1 in 10 patients is dead and 1 in 4 has been readmitted, half of these because of recurrent symptoms of heart failure (3). Readmission rates approaching 50% at 6 months contribute to an annual Medicare expenditure of nearly $17 billion (4,5). Because of casual retrospective estimates that nearly three-fourths of early readmissions may be preventable (6), public and private payers have increasingly targeted reduction in readmission rates as a primary focus of pay-for-performance initiatives. Financial penalties for 30-day readmissions as part of the demand for "accountable" care have shifted hospital incentives toward support for improving education, post-discharge care transitions, and palliative care integration for patients with heart failure (7).

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Even with widespread implementation of a package of post-discharge strategies that successfully addresses the triggers of readmission, episodes of heart failure decompensation will continue to occur. Earlier recognition of clinical deterioration in well-managed populations should increasingly permit timely intervention in the ambulatory setting to restore compensation. However, patients concerned about clinical changes and physicians discomfited by the heart failure diagnosis frequently use the emergency department (ED) as the first point of call. Faced with a broad array of urgent conditions, the ED has not been an efficient point of triage for patients with heart failure. Fewer than 20% of patients with heart failure presenting to the ED are discharged directly to home (8), and even fewer are likely to remain home, given that recurrent event rates for patients with heart failure after discharge from the ED have in some cases exceeded those for hospitalized patients (5,9).

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Physiologic investigation has shown that more than 90% of heart failure hospitalizations follow gradual increases in intracardiac filling pressures that are restored to baseline during therapy in hospital (10). The only real therapeutic change during most heart failure readmissions is the administration of intravenous diuretic agents, with an average fluid loss of about 4 kg and monitoring only by bedside clinical assessment and routine laboratory tests (11). The average length of stay for patients with heart failure in the United States has fallen considerably in recent years, with nearly 25% of patients now discharged within 4 days of admission (12). Because resting symptoms are frequently relieved within 24 h (13), it is reasonable to ask whether hospital admission is truly necessary for patients who 1) present with a low-risk profile for adverse events during treatment, 2) respond rapidly to initial treatment, and 3) can be followed closely in the ambulatory clinic.

In this issue of the *Journal*, Collins et al. (14) articulate a strong theoretical case for inserting the heart failure observation unit (OU) as an intermediate step between home discharge from the ED and inpatient admission. The choice of the term "observation" is partly strategic, as OU stays (<24 h) are currently exempt from penalties imposed on 30-day readmissions and might therefore provide a lower-cost alternative to hospitalization for selected patients. In this framework, patients with heart failure would undergo rapid stratification of risk on arrival to the ED on the basis of a limited initial evaluation and early response to doses of intravenous diuretic agents. High-risk patients would be triaged to inpatient admission, while low-risk and intermediate-risk patients unsuitable for immediate home discharge would be sent to the OU for additional evaluation and management. The investigators speculate that up to 50% of those triaged to the OU in this fashion might be sufficiently improved within 24 h to permit home discharge without the need for admission, while the rest would require extension to a conventional inpatient stay. Encouraged by the success of OUs for managing low-risk patients presenting to the ED with chest pain and a small pilot experience in patients with heart failure (15), they propose that a randomized trial powered to examine the impact of the OU

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approach on mortality and readmission rates in heart failure is now warranted.

The need for alternate routes to steer around heart failure hospitalization is indisputable, as is the need to embark on them without delay. However, there are daunting challenges to the immediate implementation of a randomized clinical trial to test the incremental value of this approach over routine care. The term "observation" itself is appropriate for chest pain of unknown etiology but seriously misleading when applied to heart failure decompensation, which may be mild but is never entirely benign. Regardless of whether triage takes place under the supervision of ED staff members or heart failure providers in a dedicated ambulatory unit, many active steps are necessary to ensure that the decompensation event is successfully reversed and the long-term course is stabilized (Table 1). Practically, local variation in both geography and personnel providing heart failure care (physicians, specialty nurses, pharmacists, social workers) may create substantial heterogeneity in how this transition hub should be structured to address these multiple goals.

What do we need to know before launching into a trial of such a program? The first roadblock is how best to stratify risk at the initial point of triage. Divergent secular trends in lengths of hospital stay and readmission rates for patients with heart failure (12) underscore that the selection of appropriate patients for early discharge remains a major hurdle. There are few data to formalize a decision about which patients with heart failure can be safely and effectively managed out of the hospital. The investigators have proposed a limited set of parameters (blood pressure, blood urea nitrogen, serum creatinine, and cardiac biomarkers) that discriminate the risk for mortality in the hospital with acute decompensated heart failure (16), but these have not been validated as a guide for sending patients home before full stabilization. Unmentioned factors such as cognitive impairment and inadequate social support may occasionally be of greater importance than laboratory and hemodynamic criteria in this regard.

The risk for early mortality is not the only relevant criterion for admission. The relative benefits of hospitalization over home discharge vary according to the reason for heart failure exacerbation and the location along the overall trajectory of illness (Fig. 1). As systems are redesigned, care must be taken to contain excessive aversion to hospitalization that could become detrimental in complex situations for which an inpatient stay will still offer the best setting to integrate care for the rest of the journey.

Recurrent decompensation in the high-risk period early after hospital discharge (point 1 in Fig. 1) may reflect incomplete treatment or accelerating renal dysfunction, for which readmission may be necessary, or care coordination failure that could be addressed during a social work consultation during an intravenous diuretic infusion. A superficially similar event disrupting the stable plateau phase (point 2) may reflect dietary indiscretion or medication nonadherence that can be rapidly addressed in the ED, or the appearance of a new condition (point 3), such as atrial fibrillation or thyroid disease, that will require complex decisions. Patients with an accelerating pattern of ED presentations in the pre-terminal phase of illness (point 4) may merit hospital admission to consider advanced heart failure therapies or redefine overall goals of care, but those in the end stage of their disease (point 5) might reasonably be discharged home if the appropriate ambulatory supports for palliative care are in place. Thus, even the first step of initial triage is probably not ready for a uniform approach to risk stratification.

For those admitted to the OU, the second triage point is uncharted territory. What is the optimal method for determining readiness to leave the hospital after <24 h? Available discharge risk scores apply only to traditional inpatient stays, with goals of complete decongestion and stabilization of fluid balance on oral diuretic agents, treatment of

Table 1 Heart Failure Triage and Intervention: Essential Elements Regardless of Site and Staff

Triage	Intervention
Focused H&P for hemodynamic profile (wet or dry/warm or cold)	
Consideration of inciting factors*	
Review of renal function, electrolytes, other focused tests	
Initial triage for intervention as needed	For typical decompensation, select diuretic dose and define first target response (net output desired)
Home with early follow-up	Adjust vasoactive medications if needed for blood pressure and renal function
Ambulatory intervention	Link as needed to team members providing specific services†
Inpatient	Transition with communication of plan for next steps
Reassess after intervention	If to home
Retriage for next steps	Specify diuretic plan
Home with early follow-up	K+ plan
Return for triage next day	Resume or revise other HF medications
Inpatient admission	Clarify timing and person responsible for review of next laboratory tests
	Outpatient follow-up appointment
	Provide instructions for whom to call and when if symptoms worsen

*For example, arrhythmias, infection, ischemia, medication change, side effects, conflicting medications, worsening renal function, anemia, uncontrolled diabetes, thyroid disease, depression, and home support gaps. †Roles vary depending on practice patterns, with services typically provided by a team including advanced practice heart failure nurses, a pharmacist, a social worker, a psychiatrist or psychologist, and palliative care specialists, with same-day consultants available as needed (e.g., for diabetes and pulmonary disease).

H&P = history and physical examination; HF = heart failure.