Brief Report

Improving Outcomes for Patients with Heart Failure After Discharge: Mind the Gap

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To reduce health care costs and improve patient and caregiver experiences, health policy makers in many countries, including the United States and the United Kingdom, are placing an increasing emphasis on efforts to reduce 30-day readmission rates. Heart failure (HF) is one of the diagnoses commonly targeted by such programs because it accounts for nearly 5% of total Medicare spending, is the leading cause of hospitalization in older adults, and nearly one-fourth of patients discharged after a HF hospitalization are readmitted within 30 days.[1] Although numerous approaches to reducing readmissions have been tested, the results have often been disappointing.[2] This is perhaps not surprising, because only a minority of readmissions appear to be truly preventable.[3] Indeed, up to two-thirds of readmissions in patients with HF are driven by their comorbidities rather than their HF,[1] and because the comorbidity profile of patients with heart failure worsens over time, this proportion is only going to expand.[4]

However, in the past 2 decades multiple randomized trials have proven that transitional care services or disease management programs that use home visits and close face-to-face follow-up (often with nurses) within 1−2 weeks after discharge reduce readmissions and mortality in patients with heart failure.[5,6] Such approaches are therefore now firmly ensconced in HF guidelines. Yet many of these disease management programs are multimodal, resource-intensive, and costly, and not all patients benefited, even in the optimized setting of randomized trials. In fact, some home-based interventions actually worsened outcomes in older patients with heart failure with high comorbidity burdens.[7] With the increasing emphasis on patient-centered care and cost-efficiency in health care, the focus of researchers has moved from proving that HF disease management programs work to trying to target them to those patients most likely to benefit from them.

To that end, the report from the ETHELRED Investigators[8] in this issue of the *Journal of Cardiac Failure* is a valuable addition to the literature. The ETHELRED study enrolled 412 patients typical of most hospitalized HF cohorts in the developed world: mean age 74 years, high comorbidity burden (mean Charlson score 7.3), and 82% taking an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker, 77% a beta-blocker, and 45% an aldosterone antagonist. Patients were randomized to usual care or a multimodal disease management program that included elements[7] proven to work in multiple settings: telephone follow-up with a transition coach within 3 days of discharge, at least 2 home visits by nurses within the first 2 weeks after discharge, and close surveillance for the first month with medication titration as needed by the transition team (coach, nurse, cardiologist). The arms were well balanced at baseline, the study was rigorously conducted, and the results were clear: those patients exposed to the disease management program exhibited a substantial reduction in death and readmission at 30 days (23% vs 37%, relative risk [RR] 0.62, 95% CI 0.46−0.84, number needed to treat [NNT] 7) and 90 days (36% vs 57%, RR 0.63, 95% CI 0.51−0.78, NNT 5). Despite staying in hospital nearly a day longer during the index hospitalization (because part of the disease management program involved keeping patients in hospital until their fluid status was optimized as judged with the use of echocardiography or B-type natriuretic peptide measurements), the intervention arm spent significantly more days out of hospital in the 30 and 90 days after enrollment than those allocated to usual care. There was a statistically significant interaction between treatment benefit and baseline risk, with markedly greater benefits in higher-risk patients (ie, NNT <3 at 30 days for those in the highest quintile of predicted risk). Although the cost-effectiveness of their approach has yet to be reported, the ETHERLED investigators have convincingly demonstrated that a risk score can be used to successfully identify and intervene in those patients most likely to benefit from an expensive multimodal intervention to improve post-discharge prognosis.

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What do these results mean for clinicians and policy makers? Others have shown that even experienced clinicians (physicians, nurses, and case managers) are unable to accurately identify those patients most likely to be readmitted.[9] Moreover, although the number of published readmission prediction scores now exceeds 75, and these scores have expanded beyond merely incorporating demographic and clinical variables to include assessments of cognition, frailty, depression, social contextual factors, biomarkers, and (in the ETHELRED study) even assessments of right atrial pressures and left atrial volumes, their abilities to predict risk remain modest, with most reporting c-statistics in the range of 0.55−0.70.[10] Although no model has emerged as the best in all situations, even if there were a single criterion-standard risk-prediction equation, it is not as simple as just identifying those patients with the highest scores. Rather, clinicians and system planners must identify those high-risk patients most likely to benefit from disease management programs at hospital discharge. As pointed out by Steventon and Billings, "While predictive models are designed to assess risk, the assessment of impactibility [sic] requires consideration of factors such as the willingness and ability of patients to participate in programmes that can improve their outcomes … [S]uch an assessment is likely to require clinical experience."[11] Thus, while proponents of data mining, artificial intelligence, and machine-learning algorithms trumpet the promise of electronic medical records and computerized decision support tools to identify at-risk individuals in real time at the point of care,[12] there will always be a need for clinicians to interpret any flags raised.

Once we identify those patients with heart failure at highest risk who are likely to benefit from intervention, what should we offer them? Rather than advocating in-home visits for all patients with heart failure after hospital discharge, I agree with the more nuanced approach advocated in the ARISE framework,[4] which takes into account each patient's values, preferences, and social circumstances as well as their comorbidity profiles and absolute risk estimates. During their hospitalization, all patients with heart failure should receive education about their disease and therapy options, especially the importance of adherence, personalized dietary and exercise advice, and instruction on self-care activities such as daily weight monitoring and avoidance of HF triggers. At the time of discharge, there are 3 options:

1. For patients with uncomplicated HF, standard outpatient follow-up care within 2 weeks, preferably with a clinician who knows them,[13] may be sufficient (with or without involvement of a specialized HF clinic, depending on the frequency of exacerbations and stability of therapy).
2. For selected patients at higher risk for poorer outcomes (according to whichever risk-prediction equation includes locally available variables and has been validated in that setting), multidisciplinary home-based interventions such as those used in the ETHELRED study should be used to mitigate the risks. Because trials of other transition elements, such as telehealth applications, have yielded conflicting results,[5,6] any incorporation of such elements into a disease management program should be accompanied by a plan to evaluate outcomes.
3. For patients with heart failure at the highest risk of adverse outcomes who are very symptomatic and have goals of care focusing on quality rather than quantity of life, referral to specialized palliative care services for symptom optimization are likely to be more beneficial than HF-focused disease management programs.[14,15]

In 2019, we have moved beyond asking whether multidisciplinary disease management programs work in HF to instead focusing on delivering the key elements of such programs to those patients most likely to benefit from them. One size definitely does not fit all and it is incumbent on clinicians to apply these interventions to the right patients at the right time in their disease trajectory. It is also incumbent on health policy planners to tailor interventions to their local setting and to ensure that any implementation of a readmission reduction strategy is accompanied by a robust evaluation of its impact. In particular, given emerging evidence that decreases in 30-day readmissions after implementation of the Hospital Readmissions Reduction Program were accompanied by increases in 30-day and 1-year mortality,[16,17] such evaluations should not just focus on readmission rates but should include other outcomes such as mortality or emergency department use. Only then can we start to close the gaps between hospital and community that our patients too often fall through after discharge.

Disclosures

None.

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