

EDITORIAL COMMENT

## Hospital Strategies to Reduce Heart Failure Readmissions

### Where Is the Evidence?\*

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Heart failure (HF) currently affects 6.5 million adults in the United States (1), and its prevalence is projected to increase by 25% by 2030 (2). Hospitalization represents a turning point in the natural history of HF, with a combined mortality and readmission rate of 30% within 90 days post-discharge; one-quarter of patients are readmitted within 30 days (3,4). Hospitalizations are responsible for the majority of the \$39 billion spent annually for HF care (5). It is not surprising therefore that HF hospitalization is a focal point for quality improvement (QI) and cost reduction attempts. The Centers for Medicare & Medicaid Services (CMS) has mandated reporting of hospital-level 30-day readmission rates for HF and acute myocardial infarction (AMI) in an effort to improve outcomes (6). Public reporting of outcomes as hospital performance indicators and incentive for improvement has not always proved to be effective, and public reporting has had a minor effect on outcomes (7,8). The escalation of this paradigm to deny payment for readmission within 30 days of discharge has been a game changer and has resulted in a widespread concern across hospitals.

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What are the hospitals doing to meet this challenge? In this issue of the *Journal*, Bradley et al. (9) report the results of a survey to describe the practices employed by hospitals enrolled in the Hospital to Home (H2H) QI initiative to reduce readmissions for HF or AMI. The response rate of 90.4% reflects the strong motivation of the participating hospitals. The reported practices focused on resources and performance monitoring, medication management, and discharge planning and follow-up care. Eighty-seven percent

of hospitals had a QI team, and professionals with diverse backgrounds staffed them. Hospitals tracked a variety of metrics and employed various approaches for medication reconciliation and discharge planning. These findings highlight that hospitals invest significant resources for QI. It is striking that hospital practices are diverse and adoption rates variable. There are some inherent limitations of this survey that the investigators acknowledged. However, the purpose of this survey was to scan the environment, and the results provide valuable information.

The overarching question, however, is not what the hospitals are doing to prevent HF readmission, but why are they doing it and what is the evidence that these interventions are effective and cost-effective? The answer to why is simple, because they are compelled to do so. The perspective of pay-for-performance is a strong incentive for action. However, the underlying logic model has several assumptions that link the program activities to short- and long-term impact. In the case of QI programs to reduce HF readmissions, this logic model is weak. The first assumption is that program implementation will change actual practice; however, increased documentation of quality metrics is not synonymous with patient-level modification in practice (7). The second assumption is that QI interventions will be effective irrespective of how they are implemented. Lastly, the bigger assumptions are that the short-term effect will affect readmission rates and that reduced readmissions will improve quantity and the quality of life of patients, and reduce costs. It is worth further examining these assumptions.

Does conformity with process of care measures improve HF outcomes? Not necessarily. Unless the link between process of care and outcomes is strong, a QI program may reliably improve compliance with process of care measures without affecting outcomes. In OPTIMIZE-HF (Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients With Heart Failure), only medications with proven efficacy by randomized trials were associated with improved outcomes, but the processes based on expert opinion or observational data were not (10). It is also important to note that the underlying evidence base for interventions for AMI versus HF is quite different. HF is a complex disease, and what should work logically does not always work in practice. The barrage of negative trials in HF during the last decade highlights this. Could this be the case with the emerging shift towards discharge planning and its various components as the new focus of efforts to reduce HF readmission? This question is ultimately important considering the second assumption stated previously (i.e., interventions are effective irrespective of the approach to implementation). Could it be possible that the past expert opinion-based logical interventions were not associated with tangible improvement in outcomes because of the vast heterogeneity with which they were implemented across institutions? What does it mean to give “discharge instructions to patients”: providing printed materials, a nurse

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discussing with the patient or a physician discussing with the patient, or a multidisciplinary team conducting a family meeting? Understanding implementation is critical. Otherwise, we might be misled by negative trials to believe that the interventions are ineffective, whereas the problem is with implementation.

Public reporting of discharge planning may have no effect on outcomes (7). The notion that it is the discharge planning “culture” that needs to be fixed has prompted large national QI initiatives (11,12). The supporting data for early follow-up comes from a meta-analysis (13) that mostly included studies with actual home visits, and an observational report where early follow-up was associated with reduced 30-day readmissions (14). The latter study did not assess whether time-to-first-visit post-discharge was associated with readmission, but instead looked at quartiles of patients who had clinic appointments within 7 days and linked it to outcomes. There was no difference in readmission rates between quartiles 2 and 4, and the first quartile showed a reduction by 2.7% only, which was likely influenced by selection bias based on characteristics that led to early follow-up. Of note, another study found no effect on 30-day or 6-month outcomes with early follow-up (15). Evidence for medication reconciliation was also not conclusive. In a randomized study of pharmacist-led intervention to optimize HF therapy, there was no improvement in outcomes (16). Similar experience was reported for patient education, self-care, and symptom management. In a study of disease-management programs funded by CMS costing over \$400 million, no reduction in utilization of acute care or cost savings was demonstrated for patients with HF and/or diabetes (17). These programs included nurse-based call centers, health coaches to target persons at high risk for adverse events, and intensive patient education using a variety of resources to improve understanding of disease, self-care, and communication with providers. Yet, despite modest improvement in quality measures, no meaningful impact on outcomes or costs was observed. In all, the evidence supporting various forms of disease management and early clinic follow-up to improve HF outcomes and reduce costs to date is inadequate.

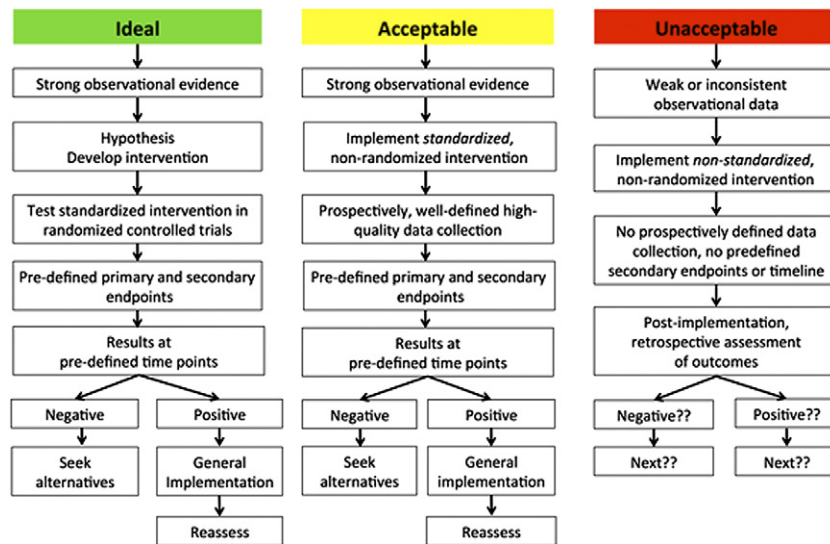
The literature is replete with interventions proven not beneficial in trials despite encouraging observational data and logic. In the case of HF, there are now 2 telemonitoring and 1 self-care intervention trial that showed no benefit (18–20). The only approved interventions that showed improvement in post-discharge outcomes in acute HF were randomized trial proven medical therapies for chronic HF that can be implemented during admission to optimize care (10). Otherwise, unlike AMI, there are currently no discrete evidence-based interventions targeted at acute HF that have been shown to improve post-discharge outcomes. How is it possible that all these logical, good clinical practice interventions had no effect on outcomes? Does it really make sense to not follow-up patients after discharge or not educate them? Of course not! However, these negative trials

nevertheless underscore the importance of carefully considering the implementation science behind these interventions and focus not only on the right intervention, but also on the right intervention on the right patients implemented in the right manner, otherwise one will continue to risk negating or diluting the benefits.

With weak evidence behind the surveyed processes of care, promoting compliance with these activities is premature. These are expensive endeavors. Instead, funding science to identify effective interventions might be a worthier investment. Currently, hospitals are allocating considerable resources on reducing HF readmissions by assuming that simple causative processes underlie a very complex problem. Tying a performance measure to reimbursement is guaranteed to improve the measure, one way or another. For HF, it is unclear whether this will translate into improvement in outcomes and costs. The assumption that most HF hospitalizations are preventable and may reflect suboptimal care can be challenged (21,22).

Financial incentives are strong motivators, but the goals achieved may not always be beneficial. For example, a trend toward worsening post-discharge 30-day HF readmissions was observed when incentives drove hospital length of stay down (22). For some interventions, there is no way around but to conduct randomized trials. However, there are neither enough resources nor time to wait for such data to be accrued in every case. However, this does not mean that one should take observations as factual evidence. For interventions without an obvious downside (e.g., medication reconciliation), it is fair to assess the intervention more in the QI spirit of Plan-Do-Study-Act paradigm. However, we have to study it. We should define and standardize the intervention and develop pre-defined metrics for the effectiveness of these activities. It is not uncommon that such interventions are implemented across institutions, and across different departments or units within a given institution, without standardization or plans for how and which data will be collected when to assess their effectiveness. They nevertheless are expensive and, without proper data collection regarding their effectiveness and unintended consequences, we will never know the subtleties and nuances of when they do and do not work and how to improve them (Fig. 1).

In summary, Bradley et al. (9) should be congratulated for a timely paper that describes important information. The scope of activities recently spawned by the CMS decision to not pay for early readmissions is overwhelming. Unfortunately, many of these activities are neither proven nor primarily based on the motivation to improve patient outcomes, but rather on the fear of punitive financial disincentives. Would these enormous resources spent by hospitals to randomly implement unproven interventions be better spent on actually studying what the real determinants of HF hospitalizations are and which interventions will prove to be beneficial? Such questions are difficult to answer when policy trumps science. We agree with the investigators



**Figure 1. Paradigms for Implementation of Process-of-Care Interventions**

Ideally, process-of-care interventions would be implemented in a rigorous, hypothesis-driven setting with pre-defined outcomes reported at pre-determined time points. A pragmatic alternative would be to collect high-quality, protocol-driven data in an observational setting. However, wide implementation of nonstandardized interventions without pre-defined endpoints or a time frame when their effectiveness is evaluated is scientifically suboptimal and not conducive to derive valid conclusions.

in their concluding remarks that more evidence establishing the effectiveness of the various hospital practices is needed.

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