Rethinking the Focus of Heart Failure Quality Measures

E. Wilson Grandin, MD, MPH; Mariell Jessup, MD

By the early 2000s, several landmark trials had demonstrated clear morbidity and mortality benefit for neurohormonal antagonists and vasodilators in patients with heart failure and reduced ejection fraction (HFrEF), including β-blockers, angiotensin-converting enzyme inhibitors (ACEi), angiotensin receptor blockers, aldosterone antagonists, and the combination of hydralazine and isosorbide dinitrate. These therapies were justifiably assimilated into guidelines for the treatment of patients with HFrEF, but evidence emerged documenting wide variability in compliance with evidence-based therapies and clinical outcomes. At the same time, important studies highlighted that patients started on ACEi and β-blockers while hospitalized for heart failure (HF) were much more likely to remain on these therapies during follow-up than if initiation was deferred to the outpatient setting. Hospital-based interventions to improve compliance with HF therapies suggested clinical benefit with reduced HF readmissions and mortality, and support for this inpatient strategy was buttressed by similar efforts aimed at patients with coronary artery disease.

In this context, the American Heart Association launched its Get With the Guidelines – Heart Failure (GWTG-HF) program to increase the adoption of evidence-based HF therapies during hospitalization with the hope of improving outcomes. GWTG-HF expanded on initial quality metrics adopted by the Center for Medicare and Medicaid Services and the Joint Center for Accreditation of Healthcare Organizations and focused on the initiation of evidenced-based medications, implantation of appropriate device therapy, and compliance with several key process measures (Table). GWTG-HF provides participating hospitals with professional education, clinical support tools, patient education resources, quality improvement staff, and site-specific performance data. Since its inception in 2005, hospital participation in GWTG-HF has grown substantially. Although there has been an encouraging increase in adherence with HF performance metrics, the impact on clinical outcomes has been somewhat disappointing.

In this issue of Circulation, Allen and colleagues present new findings from the GWTG-HF registry describing the burden of new medications that must be initiated for hospitals to be compliant with HF guidelines. This study is an important step toward quantifying the magnitude of the problem faced by providers and patients to achieve an optimal HF medical regimen. The study examined data from >150,000 patients admitted with HF to 271 US hospitals from April 2008 to June 2013 and compared the admission medications with the regimen at discharge and the regimen recommended by GWTG-HF. Importantly, 38% of the patients had HF with preserved ejection fraction, where the majority of HF quality indicators are not applicable. Of the remaining 97,888 patients for whom the GWTG-HF metrics are most relevant, 24% were receiving all indicated therapies at the time of admission, 53% required 1 to 2 new medications, and 22% required 3 to 5 new medications. Among eligible patients, there was considerable variability in the rates of new prescriptions across the different drug classes: >90% for ACEi/angiotensin receptor blockers and β-blockers, 56.4% for anticoagulants, 27.2% for aldosterone antagonists, and 18.9% for the combination of hydralazine and isosorbide dinitrate.

The authors acknowledge some important limitations of this study. Most noteworthy is the lack of data on subsequent clinical outcomes, precluding an assessment of whether the number of new drugs required or the gap between the prescribed and guideline-indicated therapies impacts outpatient medication adherence, HF readmission, or mortality. There was also no ability to account for the titration of medications already prescribed on admission, and some patients may have had substantial augmentation of their medical regimen without starting new drugs.

A central question raised by this study is whether clinicians should attempt to maximize the dose of each medication class in a stepwise, hierarchical fashion versus maximizing the total number of evidence-based therapies for each patient. Higher doses of neurohormonal antagonists have been consistently associated with reduced morbidity and mortality in HFrEF, but the maximum tolerated dose of each medication varies widely across individuals. The majority of pharmacological therapies for HF are vasoactive, and simultaneous initiation could limit the maximum tolerated dose of each drug and obscure identification of the culprit agent if side effects develop. Furthermore, drug classes may have a differential impact on mortality even when titrated to similar hemodynamic indices.

The increasing complexity of medical regimens for HF poses substantial logistical and financial challenges to patients and threatens to erode compliance. Although not well studied in HF, data from other diseases show a clear signal for reduced
compliance with more complicated medical regimens, and several studies have revealed suboptimal medication adherence in HF patients with an adverse impact on clinical outcomes. However, there is evidence for incremental benefit of combination therapy in HFrEF, which may extend to at least 4 to 5 distinct therapies, and studies suggest a placeholder phenomenon whereby patients are more likely to be treated with key HF medications during follow-up if those medications are prescribed before discharge. The findings from Allen et al highlight the need for a formal study to examine the optimal strategy for initiating new HF medications with hard clinical end points including readmissions and survival.

Despite uncertainty about the optimal strategy for drug initiation, our current HF quality programs focus on assessing this process during hospitalizations. The duration of HF hospitalizations has progressively shortened, with large registries reporting a median length of stay of 4 to 5 days. As the medical armamentarium for HFrEF continues to expand and inpatient stays are compressed, it becomes increasingly impractical and potentially dangerous to require inpatient initiation of several new medications that can have synergistic effects on heart rate, blood pressure, renal function, and serum potassium.

Given the burden of new medications required to comply with performance measures like GWTG-HF and the attendant

<table>
<thead>
<tr>
<th>Table. Quality Improvement Programs for the Treatment of Patients With Heart Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Metrics and Clinical Outcomes</strong></td>
</tr>
<tr>
<td><strong>CMS/JCAHO</strong></td>
</tr>
<tr>
<td><strong>Medications</strong></td>
</tr>
<tr>
<td>ACEi or ARB for LVSD</td>
</tr>
<tr>
<td>BB for LVSD</td>
</tr>
<tr>
<td>AldA for LVSD</td>
</tr>
<tr>
<td>H-ISDN for blacks with LVSD</td>
</tr>
<tr>
<td>Anticoagulation for patients with atrial fibrillation/flutter</td>
</tr>
<tr>
<td>Statin for patients with vascular disease (CAD, PAD, CVD)</td>
</tr>
<tr>
<td><strong>Devices</strong></td>
</tr>
<tr>
<td>CRT for LVEF ≤ 35% and appropriate QRS duration/morphology</td>
</tr>
<tr>
<td>ICD for eligible patients with LVEF ≤ 35%</td>
</tr>
<tr>
<td><strong>Process measures</strong></td>
</tr>
<tr>
<td>Evaluation of LV systolic function</td>
</tr>
<tr>
<td>Discharge instructions provided</td>
</tr>
<tr>
<td>Postdischarge follow-up appointment scheduled at discharge</td>
</tr>
<tr>
<td>Pneumococcal vaccination</td>
</tr>
<tr>
<td>Influenza vaccination during flu season</td>
</tr>
<tr>
<td>Heart failure education for patients</td>
</tr>
<tr>
<td>Smoking cessation</td>
</tr>
<tr>
<td>Blood pressure control (SBP &lt; 140 and DBP &lt; 90 mm Hg)</td>
</tr>
<tr>
<td><strong>Clinical outcomes</strong></td>
</tr>
<tr>
<td>Decreased readmissions</td>
</tr>
<tr>
<td>Decreased short-term (30–90 days) mortality</td>
</tr>
<tr>
<td>Decreased long-term (1–2 y) mortality</td>
</tr>
</tbody>
</table>

ACEi indicates angiotensin-converting enzyme inhibitor; AldA, aldosterone antagonist; ARB, angiotensin receptor blocker; BB, β-blocker; CAD, coronary artery disease; CMS, Center for Medicare and Medicaid Services; CRT, cardiac resynchronization therapy; CVD, cerebrovascular disease; DBP, diastolic blood pressure; GWTG-HF, Get With The Guidelines – Heart Failure; HF, heart failure; H-ISDN, hydralazine and isosorbide dinitrate; ICD, implantable cardiac defibrillator; IMPROVE-HF, Improve the Use of Evidence-Based Heart Failure Therapies in the Outpatient Setting; JCAHO, Joint Commission on Accreditation of Healthcare Organizations; LBBB, left bundle-branch block; LVSD, left ventricular systolic dysfunction; OPTIMIZE-HF, Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure; PAD, peripheral artery disease; and SBP, systolic blood pressure.

Symbols in the Table are defined as follows:

✔, This metric was measured in the quality improvement program.
Yes, Published studies show improvement in this outcome.
No, Published studies show no improvement in this outcome.
?, There are no published studies examining the impact on this outcome.

*For Clinical Outcomes, the numbers next to the “Yes” or “No” indicate the relevant reference for studies evaluating this outcome.
†The 30-day readmission rate was reduced from 24.6% to 24.2%, and after multivariable adjustment the absolute difference was –0.33% (95% CI, –0.12 to –0.53%, P = 0.002).
logistical, financial, and safety concerns for patients, we must critically assess whether there is evidence to support continued focus on an inpatient strategy alone. Studies examining the impact of hospital-based interventions to improve HF outcomes have had mixed results. A nonrandomized intervention targeting inpatient initiation of ACEI therapy for HF patients across a large hospital system resulted in a significant increase in ACEI usage that was accompanied by reduced HF readmissions and mortality. Data from the Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure (OPTIMIZE-HF) registry, a predecessor to GWTG-HF, showed that hospital adherence to certain individual performance metrics, including prescription of ACEI, β-blockers, and aldosterone antagonists, was associated with modest reductions in mortality at 60 to 90 days and 1 year.

Conversely, the Initiation Management Predischarge: Process for Assessment of Carvedilol Therapy in Heart Failure (IMPACT-HF) trial randomly assigned patients admitted with HF to inpatient versus outpatient initiation of carvedilol and found no difference in the rates of death, readmission, or unplanned HF hospital visits at 60 days. Studies linking registry data from OPTIMIZE-HF and GWTG-HF with Medicare claims have revealed minimal correlation between adherence to HF guidelines and clinical outcomes, including 30-day readmissions and mortality. Alarming, hospital ranking as determined by compliance with performance measures versus clinical outcomes varied widely, which could have substantial implications for the implementation of pay-for-performance programs. Most importantly, hospital participation in the GWTG-HF program had no impact on 30-day mortality and was associated with a statistically significant but clinically trivial difference in 30-day readmissions.

Results from outpatient quality improvement efforts have been more encouraging. The Registry to Improve the Use of Evidence-Based Heart Failure Therapies in the Outpatient Setting (IMPROVE-HF) has increased the use of guideline-recommended treatments and reduced 2-year mortality. Given the similarity of the core metrics in GWTG-HF and IMPROVE-HF (Table), the differential impact on survival underscores the importance of optimizing HF therapies over time.

Collectively, these studies suggest that the next generation of HF quality efforts should be directed across the spectrum of care for patients with this chronic condition. Performance evaluation must shift to health systems providing long-term care in diverse settings rather than individual hospitals providing acute care during periods of decompensation. Similar lessons have been learned in acute myocardial infarction where valuable efforts to improve an inpatient process of care, the door-to-balloon time, failed to measurably reduce in-hospital or 30-day mortality. The focus has now shifted to increasing drug adherence after discharge and improving early recognition of acute myocardial infarction in the community to shorten the pain-to-door time.

The GWTG-HF program is a pioneering initiative that has produced major gains in the adoption of critical evidence-based therapies for HF and allowed formal study of care delivery. However, combining these important findings from Allen et al with recent studies failing to demonstrate a clear improvement in key clinical outcomes should force us to take stock of inpatient quality programs and the metrics used to judge hospitals and health systems caring for patients with HF. Maximizing the benefits of current HF therapies will require a shift toward integrated disease management spanning both inpatient and outpatient settings with the assessment of quality across health systems providing longitudinal care for patients with HF.

Disclosures

None.

References


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