Circulation Journal
Official Journal of the Japanese Circulation Society
http://www.j-circ.or.jp

REVIEW

Improving Quality of Care and Outcomes for Heart Failure
– Role of Registries –

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Heart failure (HF) results in substantial morbidity, mortality, and costs, yet quality of care varies widely and is frequently inadequate. Performance improvement registries have been developed to improve the quality of care and outcomes for patients with HF in both the inpatient and outpatient settings. HF registries in the United States include ADHERE, OPTIMIZE-HF, GWTG-HF, and IMPROVE HF. These registries collect data on clinical characteristics, admission, hospital, discharge, and/or outpatient care, as well as outcomes. Web-based tools that provide real-time feedback of performance and other quality measures benchmarked to other sites and national data are frequently utilized. Process-of-care improvement tools, including evidence-based clinical decision support, customizable order sets, and patient education are also used. Participation in performance improvement registries has been associated with substantial improvements in the use of guideline-recommended therapies for HF in both the inpatient and outpatient settings. Conformity with HF quality measures has also been shown to improve and disparities in care have also been reduced or eliminated. There have also been improvements in clinical outcomes. This paper reviews the evidence that participation in HF performance improvement registries is associated with improved use of guideline-recommended HF therapies, better conformity with quality measures, and improved outcomes in patients with HF. (*Circ J* 2011; **75:** 1783–1790)

Key Words: Follow-up studies; Guidelines; Heart failure; Outcomes

Heart failure (HF) affects over 5.8 million individuals in the United States and over 23 million worldwide.[1,2] There are approximately 2.4 million hospitalizations in the United States that attribute HF as the primary or secondary cause each year.[1] Responsible for costs of upwards of $39 billion annually in the United States alone and high rates of hospitalizations, readmissions, and outpatient visits, HF represents a substantial burden to the healthcare system.[1] Prognosis is poor once a patient has been hospitalized with HF; the mortality risk after HF hospitalization is 11.3% at 30 days, 33.1% at 1 year, and well over 50% within 5 years.[2] HF is also increasing in both its incidence and prevalence, placing a substantial burden on the healthcare system.[1,2]

Although it has been generally presumed that physicians incorporate national treatment guidelines into clinical practice, the actual assimilation of evidence-based strategies and guidelines has been demonstrated to be less than ideal.[3–8] Studies of HF care show that treatment guidelines are slowly adopted and inconsistently applied, and thus often fail to lead to improvements in patient care and outcomes. Gaps, variations, and age-, sex-, race/ethnicity-, and socioeconomic-based disparities in HF care have been described.[3–8] A number of studies indicate that a significant proportion of hospitalizations and deaths in patients with HF could be prevented with better implementation of evidence-based therapies in eligible patients without contraindications.[2] These statistics emphasize the need to develop and implement strategies to improve HF care. This article will review the role of performance improvement registries to improve the care and outcomes for patients with HF. The role of well-designed clinical registries in providing important mechanisms to conduct clinical research, analyzing patterns of care, monitoring patient safety, and evaluating healthcare effectiveness will also be discussed.

Underuse of Guideline-Recommended Therapies in HF

HF is a chronic progressive disease that results in substantial morbidity and mortality. Numerous clinical trials provide evidence that pharmacologic therapies, including angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin II receptor blockers (ARBs), β-adrenergic receptor blockers, aldosterone antagonists, and isosorbide dinitrate/hydralazine, as well as implantable cardioverter defibrillators (ICDs) and cardiac resynchronization therapy devices with defibrillation (CRT-Ds) can reduce morbidity and mortality in patients with HF and a reduced left ventricular (LV) ejection fraction (EF).[9,10] Improved care coordination, early follow-up, and HF

Received June 3, 2011; accepted June 3, 2011; released online July 5, 2011
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ISSN-1346-9843 doi:10.1253/circj.CJ-11-0582

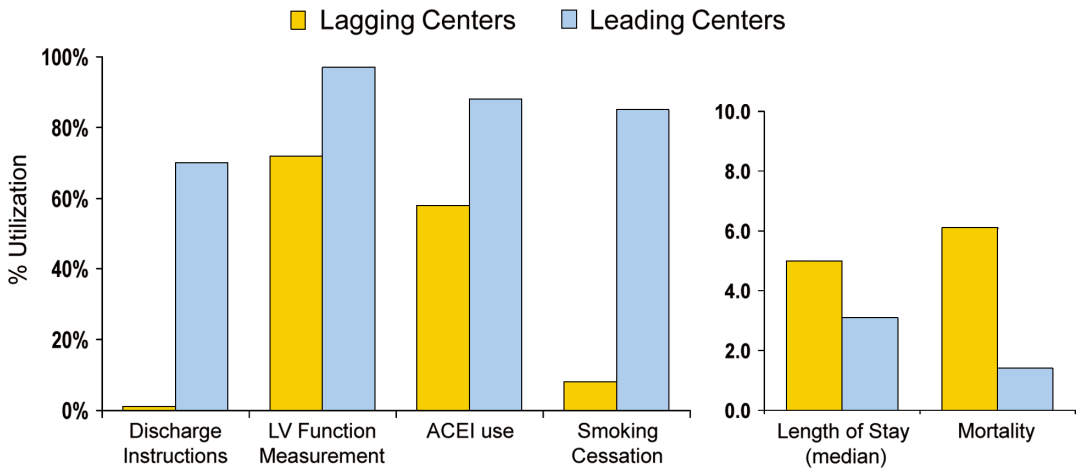

Figure 1. Variation among hospitals participating in Acute Decompensated Heart Failure National Registry (ADHERE). Study of 81,142 admissions between 6/2002 and 12/2003 at 223 hospitals grouped by leading (90th percentile) and lagging (10th percentile) centers. All P<0.0001. ACEI, angiotensin-converting enzyme inhibitor; LV, left ventricular.

disease management programs have been shown to improve clinical outcomes.[9–11] However, despite extensive clinical trial experience and recommendations in national/international guidelines, prior studies have suggested that a substantial number of eligible patients fail to receive indicated therapies and care.[3–8] Studies have shown that evidence-based, guideline-recommended therapies are significantly underutilized and there is substantial variation in adherence to quality measures for patients with HF in both the hospital and ambulatory care settings.

The Acute Decompensated Heart Failure National Registry (ADHERE) reported that one-third of eligible patients were discharged without a β-blocker and an analysis of Get With The Guidelines (GWTG)-HF showed over two-thirds of eligible HF patients were discharged home without an aldosterone antagonist.[4,7] Treatment gaps that begin in the hospital have been shown to continue in the outpatient setting, with very few patients discharged home without one or more indicated therapies being started in the first 3 months post discharge.[5] In the outpatient setting there are also treatment gaps, even among HF patients cared for in cardiology practices, particularly for aldosterone antagonists, device therapy, anticoagulation for atrial fibrillation, and HF education.[6]

There are also substantial variations in care between practice settings. Data from more than 80,000 HF admissions to academic and nonacademic hospitals in the United States participating in the ADHERE registry were analyzed to determine the rates of conformity with the 4 core performance measures for HF from The Joint Commission: discharge instructions (HF-1), assessment of LV function (HF-2), use of ACEIs in patients with LV systolic dysfunction (HF-3), and smoking cessation counseling (HF-4).[4] Across all hospitals during the study period, the median rates of conformity with HF-1, -2, -3, and -4 were 24.0%, 86.2%, 72.0%, and 43.2%, respectively.[4] Rates of conformity at individual hospitals varied from 0% to 100%, with statistically significant differences between academic and nonacademic hospitals. For each measure, there were substantial clinically relevant differences in performance between hospitals at different percentile levels. These differences were most notable for the measures with the lowest overall conformity. For HF-1, there was a 100-fold difference in conformity between hospitals at the 10th and 90th percentiles. For HF-4, there was an 11.2-fold difference in conformity at these percentiles.[4] In contrast, there was a 1.3- and a 1.5-fold difference in conformity between hospitals at the 10th and 90th percentiles for HF-2 and HF-3, respectively (**Figure 1**). Similar large variations in care have been demonstrated in the outpatient setting.[6]

There is also significant hospital-level variation in clinical outcomes. Median hospital length of stay varied from 2.3 to 9.5 days, and in-hospital mortality varied from 0% to 11.1%.[4] Among the hospitals enrolled in ADHERE there was significant individual variability in conformity to quality-of-care indicators and clinical outcomes, and a substantial gap in overall performance. Academic and nonacademic hospitals differed in their conformity with the 4 performance measures. Nonacademic hospitals demonstrated significantly better median conformity with HF-1 than academic hospitals, whereas academic hospitals demonstrated slightly better median conformity than nonacademic hospitals with HF-2 and HF-3.[4] New, more effective approaches to improve the use of evidence-based, guideline-recommended therapies for HF are needed for each healthcare setting in which these patients are encountered.

Performance Improvement Registries

The continued persistence of suboptimal adherence with evidence-based therapies for HF in the hospital and ambulatory care settings, and the significant variability between hospitals/practices in both compliance and outcome variables, provides a compelling rationale for the implementation of performance improvement registries that may improve care and outcomes for HF.

It is important to recognize why therapy is suboptimal in order to devise effective strategies to improve it. Some of the barriers that prevent the implementation of cardioprotective therapies in patients with HF are: time constraints; lack of physician training, including adequate benefits and lack of prescription experience; lack of resources; and lack of com-

munication between specialists and generalists.[4] In addition, the adherence to old guidelines that call for delaying initiation of therapy and include multiple steps, time points, and too many treatment options may deter physicians from using optimal care.[12,13]

Registry-based performance improvement interventions focus on helping hospitals and outpatient practices improve systems for treating patients with HF. The intervention commonly include guideline-based clinical decision support tool kits, educational materials, benchmarked quality-of-care reports, and structured educational and collaborative opportunities.[12,13] As part of an enhanced treatment plan, evidence-based best practices algorithms, clinical pathways, standardized encounter forms, checklists, pocket cards, chart stickers, and patient education and other materials to facilitate improved management of inpatients and outpatients with HF are provided.[12,13] Use of the tools at participating hospitals/practices are encouraged, but are generally not mandatory, and hospitals/practices can adopt or modify tools at their discretion. Some registries use a web-based system that provides quality-of-care reports for each hospital/practice, which includes benchmark comparisons with regional and national hospitals/practices.[12–14] Clinicians at participating hospitals are encouraged to participate in educational and collaborative web-based seminars and to continually evaluate, refine, and reassess care delivery throughout participation in the performance improvement registry.[12–14]

The use of HF performance improvement registries and clinical decision support tools that clarify the roles of each caregiver may help break down barriers.[12] Use of these clinical decision support tools and performance feedback may also eliminate the variability in care between hospitals/practices and improve the overall treatment of HF patients.[15]

Performance improvement registries are designed to implement a number of clinical decision support tools to facilitate the care of HF patients at each stage of care. For example, the tools for patients hospitalized with HF address each care transition, from initial presentation and evaluation in the emergency department, admission, throughout hospital stay, discharge, and the transition to the outpatient care setting.[12] Example of these HF toolkits came be found at the following websites (www.optimize-hf.org and www.improvehf.com). These tools can aid in diagnosis, prompt appropriate laboratory work, and remind the physician of the importance of an echocardiogram in HF patients to evaluate EF.[12] Use of this checklist can help the physician more accurately assess a patient's needs for indicated therapy, as well as facilitate identification of patients with contraindications to one or more therapies. Standardized order sets can serve as a guide for the physician, nurse, and other caregivers and allows each of them to follow standard HF treatment protocols and indicate each guideline-recommended therapy that has been initiated.[12] These preprinted order sets can facilitate the identification of patients with contraindications to one or more therapies and thus enhance patient safety, provide standard medication dosing, emphasize the need for monitoring certain laboratory tests, and help avoid medical errors of omission.[12] The sets can also facilitate consultation and collaborative care. Comprehensive HF critical pathway tools may be used throughout the patient's hospitalization to monitor care.[12] This tool may help clinicians recognize the signs of poor outcomes, higher in-hospital mortality, and rehospitalization. Deviations from the critical pathway can be documented and later analyzed to better understand variations and patterns to facilitate the quality improvement process.[12] A discharge summary checklist may be an important component, as it prompts physicians to evaluate the therapy on which a patient is discharged and – in light of data that shows the increased adherence to medications that are prescribed before discharge – may cause them to initiate additional evidence-based therapies.[12]

Table. Patients' Characteristics in OPTIMIZE-HF

	OPTIMIZE-HF (n=48,612)
Age, mean (SD), years	73.1 (14.2)
Female, %	52
White, %	74
Black, %	18
Asian/Pacific Islander, %	1.3
Ischemic etiology, %	46
Hypertensive etiology, %	23
Cigarette smoker within past year, %	16
No known heart failure prior to admission, %	12
LVSD, % with LVSD of those with LV function assessed	48.8
LVEF, mean (SD), %	39.0 (17.6)
Weight, mean (SD), kg	82.5 (26.4)
Systolic blood pressure, mean (SD), mmHg	142.6 (33.2)
Heart rate, mean (SD), beats/min	86.6 (21.5)
BNP, median (25th, 75th), pg/ml	800 (403, 1,660)
Troponin I, median (25th, 75th), ng/ml	0.10 (0.05, 0.30)
Sodium, mean (SD), mEq/L	136.7 (11.1)
Serum creatinine, mean (SD), mg/dl	1.8 (1.8)
Hemoglobin, mean (SD), g/dl	12.1 (3.4)
Dyspnea at rest, %	44
Dyspnea on exertion, %	61
Rales, %	64
Lower extremity edema, %	65
Jugular venous distension, %	28
Orthopnea, %	27
Insulin-treated diabetes, %	17
Non-insulin-treated diabetes, %	25
Hypertension, %	71
Atrial arrhythmia, %	31
Ventricular arrhythmia, %	6
Prior cerebrovascular accident or transient ischemic attack, %	16
Hyperlipidemia, %	32
Liver disease, %	2
Chronic renal insufficiency, %	20
Chronic obstructive pulmonary disease, %	28
Peripheral vascular disease, %	14
Anemia, %	18
Implantable cardioverter defibrillator, %	5.1
Cardiac resynchronization therapy, %	3.3

OPTIMIZE-HF, Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure; LVSD, left ventricular (LV) systolic dysfunction; LVEF, LV ejection fraction; BNP, B-type natriuretic peptide.

Results With Quality Improvement Registries

Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients With Heart Failure (OPTIMIZE-HF)

The OPTIMIZE-HF was among the first national, hospital-

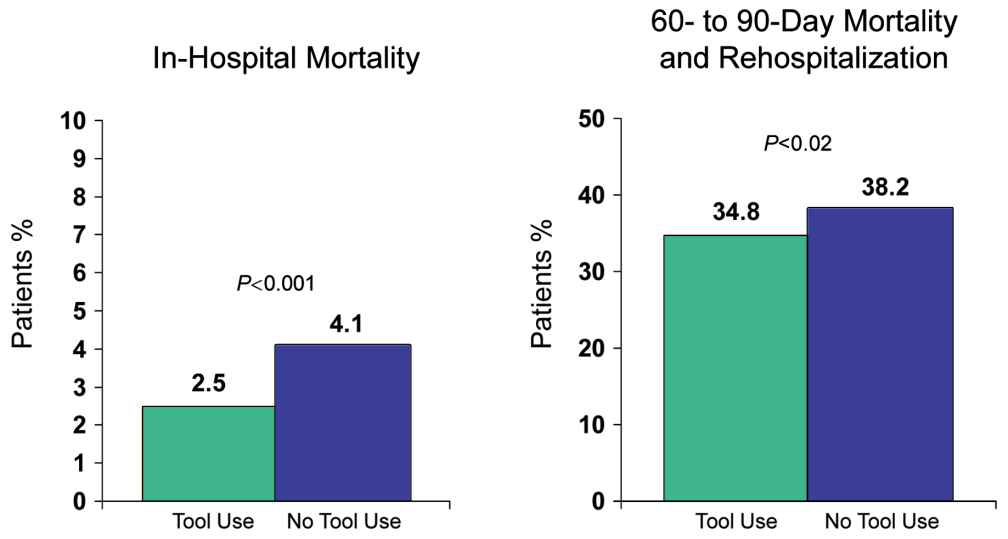

Figure 2. Association of clinical decision support tool use and clinical outcomes in Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure (OPTIMIZE-HF). Clinical decision support tool use (admission order set or discharge checklist) was documented during hospitalization in 45.3% of patients (n=22,017/48,612).

based program designed to improve medical care and education of hospitalized HF patients and to accelerate the use of evidence-based, guideline-recommended therapies by in-hospital initiation.[12,15] OPTIMIZE-HF had 2 main components designed to achieve its objectives: a web-based registry and a process-of-care improvement plan.[12] The registry tracked the use of life-prolonging therapies before and after initiation, as well as hospital progress and discharge planning. Admission, hospital, discharge care, and outcomes data were collected using a web-based registry that provided real-time feedback of performance measures benchmarked to other hospitals both regionally and nationally, allowing them to share best practices. The registry also captured outcome data for patients at 60 and 90 days after enrollment. This provided hospitals with a greater ability to understand practice patterns and current quality of care than they would have obtained using a limited number of static performance measures.

The process-of-care improvement component of OPTIMIZE-HF focused on assisting hospitals in improving their systems with regard to the management of HF patients.[12] The critical pathway from admission to discharge was managed with the use of a hospital "tool kit" that provided evidence-based best-practice algorithms, critical pathways, standardized orders, discharge checklists, pocket cards, chart stickers, and a variety of other elements to assist hospitals in improving HF management. OPTIMIZE-HF provided algorithms and dosing guides to facilitate the initiation and titration of guideline-recommended HF therapy based on American College of Cardiology/American Heart Association (ACC/AHA) HF guidelines, recent clinical trials, and the collective expertise of the OPTIMIZE-HF Steering Committee members.[12]

There were 259 US hospitals participating in OPTIMIZE-HF, submitting data on 48,612 HF patients during 2003–2004.[15] The characteristics of patients entered into OPTIMIZE-HF are shown in **Table**. With OPTIMIZE-HF, provision of complete discharge instructions and smoking-cessation counseling increased significantly (47% to 67% and 48% to 76%, respectively, P<0.0001 for both). LV function assessment started at a high rate (89%) and improved to 92% (P<0.0001).[15] ACEIs were prescribed at discharge to 75% of eligible patients and did not improve over 2 years. Beta-blocker use in eligible patients increased substantially over the same time period, from 76% to 86% (P<0.0001). There were trends for reduction in in-hospital mortality, post-discharge death, and post-discharge death/rehospitalization, and a significant reduction in mean length of stay.[15] Use of clinical decision support tools (preprinted admission order sets and/or discharge checklists) increased from 36% to 54% and was associated with an increase in the use of evidence-based therapies, lower risk-adjusted in-hospital mortality, and risk of 60–90-day death/rehospitalization (**Figure 2**).

These findings demonstrate that participation in OPTIMIZE-HF was associated with an increase in evidence-based therapy use, adherence to performance measures, and shorter length of stay for patients hospitalized with HF.[15] Increased use of process-of-care improvement tools was associated with further improvements in quality of care and outcomes. Hospital-based HF quality improvement is feasible on a national scale using this model of a performance improvement registry. OPTIMIZE-HF provides further evidence that the use of in-hospital process-of-care improvement programs and critical pathways can improve the use of life-prolonging medications, adherence to quality measures, and clinical outcomes.

ADHERE

ADHERE was designed to characterize patients hospitalized with HF and facilitate quality improvement efforts.[16] ADHERE hospitals, community, tertiary, and academic centers, were located throughout the United States and were demographically representative of the nation as a whole.[17] AHDERE collected information on demographic features, medical history, clinical characteristics, initial evaluations, therapeutic management, and in-hospital outcomes.[16] Data were collected from medical records by trained abstractors at each participating site and recorded with the use of an elec-

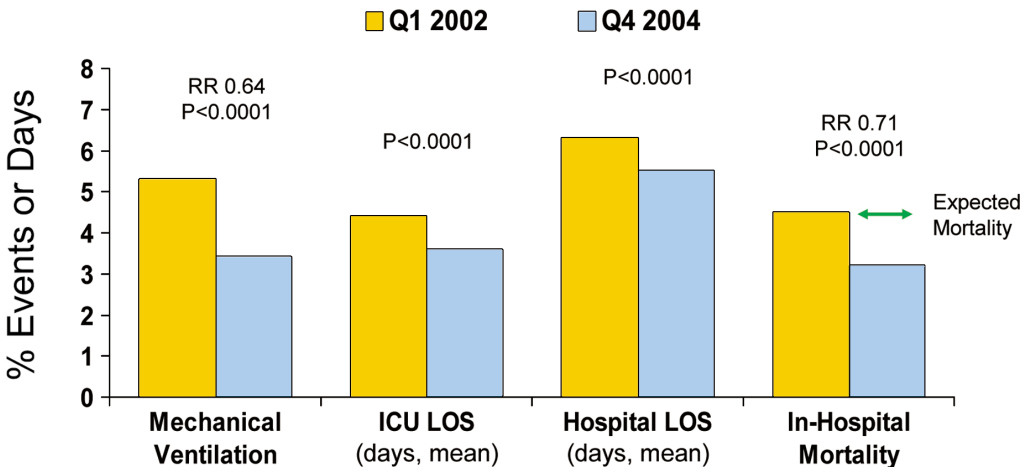

Figure 3. Trends in clinical outcomes for patients hospitalized with heart failure. Study of 159,168 patient episodes from 285 Acute Decompensated Heart Failure National Registry (ADHERE) hospitals over 12 consecutive quarters. All P<0.0001.

tronic case report form. Participating hospitals received quarterly benchmarked data reports regarding characteristics, treatments, quality measures, and clinical outcomes.

To assess the potential impact of registry participation, the temporal trends in treatments, quality indicators, and outcomes for HF hospitalizations in hospitals participating in ADHERE were evaluated over 12 consecutive quarters (1/2002–12/2004) using data from 159,168 enrollments from 285 ADHERE hospitals.[18] Patient characteristics were similar or showed only modest changes over the entire study period and severity of illness by a validated risk prediction model was unchanged over all 12 quarters. In-hospital treatment changed significantly over time, with inotropic agent use decreasing from 14.7 to 7.9% (P<0.0001). The use of β-blockers and aldosterone receptor antagonists rose substantially over time, and digoxin use fell prior to hospitalization, during hospitalization, and at discharge. There was a 30% and 29% increase in use of β-blockers during hospitalization and at discharge, respectively, during the study period. Discharge instructions increased 133%, smoking counseling 132%, LV function measurement 8%, and β-blocker use 29% (all P< 0.0001).[18] Clinical outcomes improved over time, including the need for mechanical ventilation, which decreased from 5.3% to 3.4% (relative risk [RR] 0.64, P<0.0001), length of stay (mean) 6.3 to 5.5 days, and mortality 4.5% to 3.2% (RR 0.71, P<0.0001) (**Figure 3**).[18] The observed mortality rate was substantially lower than that expected using the previously validated ADHERE risk model. This study provides further evidence that registry participation is associated with changes in care patterns and clinical outcomes. Over the 3-year period, the demographics and clinical characteristics of the HF patients were relatively similar, but significant changes in intravenous therapy, enhancements in conformity to quality-of-care measures, increased administration of evidence-based HF medications, and substantial improvements in in-hospital morbidity and mortality were observed among hospitals participating in ADHERE.[18] These findings highlight the need for further efforts to accelerate improvements in the care of patients hospitalized with HF to improve clinical outcomes

GWTG-HF

The GWTG program is a hospital-based quality improvement initiative developed by the American Heart Association with the goal of improving care for patients with heart disease and stroke.[14] Three GWTG programs have been implemented to date, including HF, stroke, coronary artery disease.[14] All GWTG programs track performance on process-of-care measures based on guidelines of the American College of Cardiology and the American Heart Association, provide quality improvement tools and process redesign support to hospitals, including decision support and collaborative meetings, and regularly report performance back to the participating hospitals. Program-specific performance achievement awards have been created to publicly recognize hospitals meeting each performance measure for a given condition in 85% or more of eligible hospitalizations for 1 year or more.[14]

Hospitals participating in the GWTG-HF program have demonstrated substantial improvements in their use of evidence-based therapies for HF over time and better performance than other US hospital not participating in the program.[14] It has also been shown that hospitals enrolled in GWTG and receiving achievement awards for high levels of recommended processes of care have lower risk-adjusted mortality for HF.[14] These better outcomes could largely be explained by better processes of care and were specific to cardiovascular care. Hospitals performing well on cardiovascular measures as promoted by GWTG did not do better on the CMS pneumonia or surgical infection prevention composite performances measures as compared with non-award hospitals.[14] Better care across all types of measures would have been expected if GWTG enrollment was only a marker and not a mediator of quality improvement. Hospital participation in GWTG has also been shown to promote equitable improvement in care, with white, black, and Hispanic patients having similar improvements in care quality over time.[19]

Improve the Use of Evidence-Based Heart Failure Therapies in the Outpatient Setting (IMPROVE HF)

Building on features of previous hospital-based programs, the aim of the Registry to IMPROVE HF was to facilitate more consistent delivery of evidenced-based, guideline-recom-

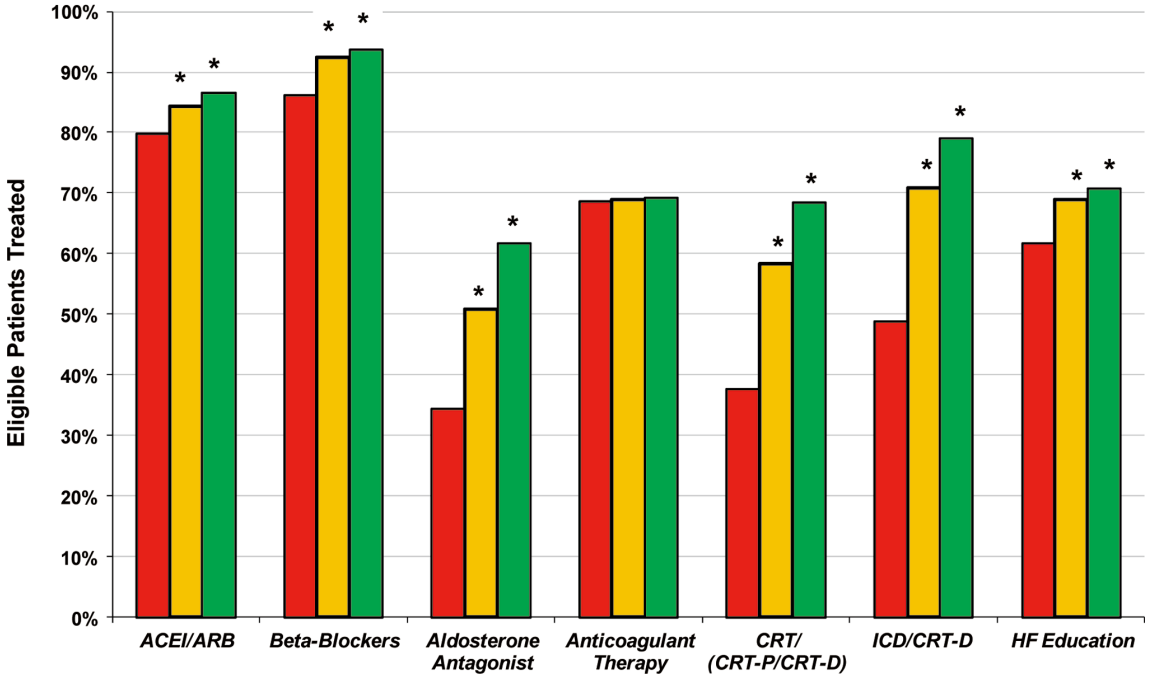

Figure 4. Impact of the Improve the Use of Evidence-Based Heart Failure Therapies in the Outpatient Setting (IMPROVE HF) on use of guideline-recommended therapies at baseline, 12, and 24 months in outpatients with heart failure. *P<0.01, 12 and 24 months vs. baseline. ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; CRT-D, cardiac resynchronization therapy (CRT) devices with defibrillation; CRT-P, cardiac resynchronization therapy with pacing; ICD, implantable cardioverter defibrillator.

mended care to eligible patients with either HF and reduced LVEF or post myocardial infarction (MI) and reduced LVEF in the outpatient cardiology and multispecialty practice settings by providing performance data feedback and a practice-specific performance improvement intervention.[13] In IMPROVE HF performance data were collected from a random sample of HF patients in 167 US outpatient cardiology practices at baseline, longitudinally following intervention at 12 and 24 months, and in single-point-in-time patient cohorts at 6 and 18 months.[13] Participants included 34,810 patients with reduced LVEF and chronic HF or post-MI. Interventions included clinical decision support tools, structured improvement strategies, and chart audits with feedback.[20] The performance improvement intervention resulted in significant improvements in 5 of 7 quality measures at the 24-month assessment compared with baseline: β-blocker (92.2% vs. 86.0%, +6.2%), aldosterone antagonist (60.3% vs. 34.5%, +25.1%), CRT (66.3% vs. 37.2%, +29.9%), ICD (77.5% vs. 50.1%, +27.4%), and HF education (72.1% vs. 59.5%, +12.6%), each P<0.001 (**Figure 4**).[20] There was no statistically significant improvement in ACEI/ARB use at the practice level, but there was at the patient level. Anticoagulation for atrial fibrillation did not improve. Sensitivity analyses at the patient level and limited to patients with both baseline and 24-month quality measure data yielded similar results.[20]

Although there are many major obstacles to overcome to improve care in the outpatient setting, cardiology practices participating in IMPROVE HF were able to improve performance on 5 of 7 quality measures. At the time of the 24-month assessment, 80.1% of the opportunities to provide evidence-based, guideline-recommended care to patients documented to be eligible were fulfilled, compared with 68.4% at baseline. Importantly, all-or-none care demonstrated an 80.6% relative improvement from baseline to 24-month assessment.[20] The relative and absolute rates of improvement in guideline-recommended use of CRT, ICD, and aldosterone antagonist therapies in eligible patients were substantial. Other studies have suggested very little change in the use of these 3 therapies for HF from 2005 to 2008, making it less likely that the improvements observed were a result of secular trends. Although the baseline rates of β-blocker use were reasonably high, there was still significant improvement at 24 months in this care measure. Documentation that HF education was provided also improved over the course of the program.[20]

IMPROVE HF demonstrates that a defined and scalable practice-specific performance improvement intervention in the outpatient setting results in substantial improvements in the use of guideline-recommended therapies in eligible patients with HF. National guidelines recommend the use of programs to identify appropriate patients for therapy, to provide practitioners with useful reminders based on the guidelines, and to continuously assess the success achieved in providing these therapies to patients who can benefit from them.[9,10] The demonstration of substantial change in the use of guide-

line-recommended therapies among practices participating in IMPROVE HF provides direct evidence in support of these recommendations. Because this program, with the exception of the practice-specific data collection, utilized existing personnel and resources within each practice, it may be more scalable and sustainable than alternative models to improve outpatient care.[20]

A recent study demonstrated that the IMPROVE HF quality measures were positively associated with HF patient survival.[21] Each 10% improvement in composite care was associated with a 13% lower odds of 24-month mortality (adjusted odds ratio 0.87, 95% confidence interval 0.84–0.90, P< 0.0001). This suggests the improved care resulting from the IMPROVE HF performance improvement intervention likely results in meaningful improvements in clinical outcomes and that these measures are helpful for measuring and improving HF care quality in the outpatient setting.[21]

HF Registries in Japan

The multicenter prospective cohort studies (eg, the Chronic Heart Failure Analysis and Registry in the Tohoku District 1 Study (CHART-1)), the more recent Chronic Heart Failure Analysis and Registry in the Tohoku District 2 (CHART-2), the Japanese Cardiac Registry of Heart Failure in Cardiology (JCARE-CARD), and other registries are providing key insights in defining the characteristics, treatments, and outcomes of HF patients in Japan.[23–28] The relationship of key comorbid conditions such as atrial fibrillation, obesity, and anemia to outcomes in patients with HF are being better defined.[25–27] Furthermore, the clinical effectiveness of discharge medications for HF, such as β-blockers, has been able to be explored.[28] These registries are also allowing cross-country comparisons of hospitalized HF patients.[23,24]

Next Steps

The gaps and variation in care that currently exist in HF care suggest that efforts targeting education and effective patient intervention, such as those initiated by performance improvement registries, will be necessary to improve the overall quality of care for patients with HF. The use of clinical registries is likely to grow, given the increasing focus on measuring and improving healthcare delivery and patient outcomes.[22] Thus, widespread implementation of hospital and outpatient based registries for HF should enhance adherence to established guidelines and key quality measures, reducing the treatment gaps, variability, and disparities.[22] Important opportunities also exist to expand the scope of performance improvement registries by integration with electronic health-record systems and linkage with administrative databases and other data sources for long-term follow-up.[22] Opportunities also exist to collaborate to create international HF performance improvement registries to improve global HF care and outcomes.

Conclusions

There is an urgent need for effective strategies to improve the use of the evidence-based therapies for HF. Participation in performance improvement registries for HF has been shown to increase the initiation of evidence-based HF therapies, improve quality of care, decrease the risk of future hospitalizations, and prolong life in patients with HF. There is significant individual variability among hospitals and outpatient practices providing care for HF in their conformity to quality-of-care indicators, plus a substantial gap in overall performance. Establishing performance improvement registries, HF disease management programs, and systems of care should help to reduce this variability from one hospital and outpatient practice to the next and eliminate these gaps. As a result, overall quality of care should improve substantially, reducing the morbidity, mortality, and economic cost associated with this disorder.

Disclosures

OPTIMIZE-HF was sponsored by GlaxoSmithKline, ADHERE was sponsored by Scios, IMPROVE HF was sponsored by Medtronic Inc, and GWTG-HF is a program of the American Heart Association. Gregg C. Fonarow, MD, is a consultant for Novartis (significant) and Medtronic (modest).

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