A Heart Failure Management Program Using Shared Medical Appointments

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Patients whose care was augmented using shared medical appointments for heart failure disease management did not have significantly better 1-year hospitalization outcomes when compared with patients who only attended a heart failure specialty clinic.

Rising health care costs have led to threats of nonreimbursement for rehospitalization within 30 days postdischarge.[1,2] Heart failure (HF) in particular is characterized by the highest 30-day rehospitalization rate (23.5% in 2013), which accounts for more than two-thirds of HF expenditures.[3,4]

Much of HF-related health care costs can be addressed with effective self-management by patients with HF. Therefore, developing and implementing effective disease management programs for this high-risk patient population is essential. Heart failure management programs may include optimizing HF medications, improving patient understanding of the importance of appropriate diet and physical activity, and cultivating psychological health and well-being.

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In a 2013 systematic review and meta-analysis, Wakefield and colleagues found that disease management programs improved nearly all HF outcomes, including lower mortality rates, lower hospital readmission rates, fewer clinic visits, higher satisfaction with care, and higher quality of life, compared with a no-treatment control or standard care.[5] Moreover, these programs demonstrated cost-effectiveness by reducing HF-related hospitalizations and health care expenditures.[5]

One method to deliver specialized disease management programs to a greater number of patients may be to use shared medical appointments (SMAs). In a randomized controlled trial, Smith and colleagues demonstrated improved HF outcomes through 7 months among veterans who attended SMAs for HF management.[6] However, the trial enrolled only 25% of patients screened, and 63% of the patients who did not enroll were classified as not interested. These findings suggest that patients with HF, and veterans in particular, may face additional barriers to enrolling in HF management programs, and these results may not be fully representative of veterans with HF.

In this study, the authors used a naturalistic study design via retrospective review of the electronic health record (EHR) to evaluate whether patients with acute HF who chose to attend SMAs promoting self-management skills for HF would have better hospitalization outcomes compared with those who received individual disease management instructions in a HF specialty clinic (ie, usual care). The authors hypothesized that veterans who participated in the HF SMA clinic would have fewer 12-month HF-related and all-cause hospitalizations, fewer days in the hospital, and more days to first hospitalization compared with patients in usual care.

METHODS

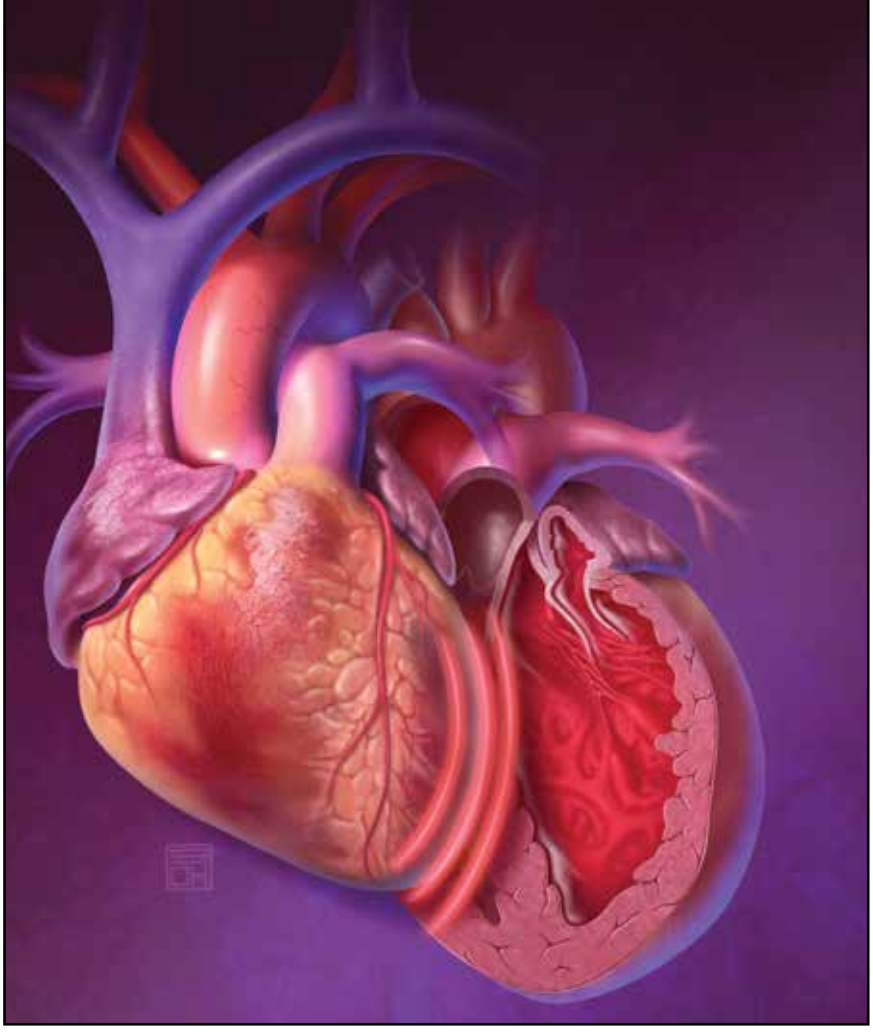
The clinic for veterans with acute HF was initiated in October, 2010 at the Jesse Brown VAMC (JBVAMC) in Chicago, Illinois, to reduce readmissions by targeting patients who had been previously hospitalized for HF. In September 2011, the multidisciplinary SMA clinic was developed within the

HF clinic to provide enhanced care focused on self-management strategies for patients with HF. The HF SMA program comprised 4 weekly face-to-face sessions co-led by a nurse practitioner (NP), a dietitian, and a clinical psychologist, similar to what has been shown to be successful and cost-effective in nonveteran populations.[6-8] Patients attended at least 4 sessions before graduating to the advanced HF SMA program where they could attend monthly booster sessions. The program promoted self-management by providing education about and support for the HF process, HF medications, diet adherence, physical activity, psychological well-being, and stress management via interactive presentations. During the visit, patients' medication and food logs were reviewed. Patients were encouraged to discuss successes and obstacles in achieving their goals. All study procedures were approved by the institutional review board at JBVAMC.

Study Design

Data were collected by retrospective review of the JBVAMC EHR. The EHR was reviewed for all veterans scheduled for ≥ 1 SMA clinic visit within the HF specialty clinic using predetermined, convenient selection between January 1, 2012, and December 31, 2013. Outcome data were collected through 12-month follow-up (through December 31, 2014).

Patients in both treatment arms received HF care through the HF clinic, including one-on-one education regarding HF self-management provided by a NP. Patients were assigned to the HF SMA group if they also attended the HF SMA clinic within 3 months of their initial HF clinic consult. The number of SMAs attended was included as a covariate in the models. Patients who were scheduled for, but did not attend, the HF SMA clinic were assigned to the HF clinic group. Patients who attended the initial HF consult before September 1, 2011, were excluded, thereby ensuring that all patients included in the present analyses had the opportunity to attend the HF SMA appointment within the predetermined period of chart review.

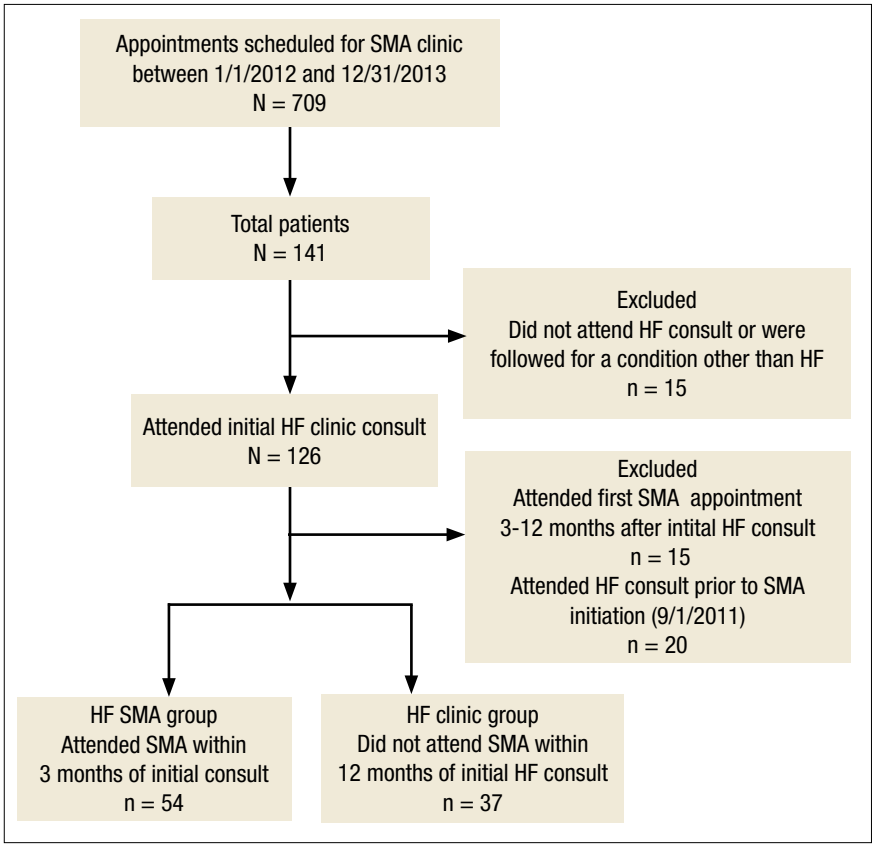


Data for all VA hospitalizations that occurred between January 1, 2012 and December 31, 2014, were extracted from the EHR. Extracted data included admission date, discharge date, and discharge diagnoses. From these data, the authors assessed 4 hospitalization outcomes for each HF hospitalization and all-cause hospitalization within 12 months of the initial HF clinic consult date: hospitalization (yes/no), number of hospitalizations, number of days in the hospital, and days to first hospitalization.

Data Analysis

Demographic, HF characteristics, and HF outcome variables for the HF SMA and HF clinic groups were compared using *t* tests and chi-square analyses. Logistic regressions were used to predict 12-month hospitalization, linear regressions were used to predict number of hospitalizations and number of days hospitalized, and Cox proportional hazards regressions were used to predict time from initial HF consult to first hospitalization for each HF-related hospitalization variable and all-cause hospitalization variable. A separate logistic regression was conducted to predict 12-month all-cause mortality. The primary predictor variable of interest for all models was group membership (HF SMA vs HF clinic). Covariates in all models included race (black vs nonblack), ethnicity (Hispanic/Latino vs non-Hispanic/Latino), age, and number of HF SMAs attended.

Figure. Patient Flowchart



Abbreviations: HF, heart failure; SMA, shared medical appointment.

RESULTS

Of 709 HF SMA clinic appointments made for 141 patients between January 1, 2012, and December 31, 2013, 54 patients were assigned to the HF SMA group and 37 patients were assigned to the HF clinic group (Figure). The majority of the sample was black (87%), non-Hispanic/Latino (96%), and the average age was 68 years. Patients were more likely to have nonischemic (rather than ischemic) cardiomyopathy (66%) and more likely to have HF with reduced (rather than preserved) ejection fraction (76%; ie, systolic HF). Furthermore, 40% of the sample was diagnosed with atrial fibrillation (AF) or atrial flutter (A-flutter), and 24% had an implantable cardioverter-defibrillator or pacemaker. There were no significant differences in demographics or HF characteristics between the HF SMA group and the HF clinic group (Table).

HF Hospitalization Outcomes

During the 12-month follow-up, 32 patients were hospitalized for HF, 18 (33.3%) in the SMA group and 14 (37.8%) in the HF clinic group, $P = .658$. Patients were hospitalized up to 4 times for between 1 and 38 days, and from 1 to 352 days postconsult. No differences between the HF SMA group and HF clinic group were observed on any of the HF hospitalization outcomes (Table). Group membership did not predict HF hospitalization (odds ratio [OR]: 0.39, 95% confidence interval [CI]: 0.11-1.42), number of HF hospitalizations (β: 0.15, SE: 0.29), number of days hospitalized for HF (β: 0.1.66, SE: 2.01), or time to first HF hospitalization (hazard ratio [HR]: 1.35, 95% CI: 0.66-2.77), all *P*s > .10. In the Cox proportional hazards regression predicting time to HF hospitalization, the coefficients did not converge when the model included demographic covariates; therefore, the model was run only with HF group as a predictor variable. For all other models, no covariates significantly predicted HF hospitalization outcomes.

All-Cause Hospitalization Outcomes

During the 12-month follow-up, 57 patients were hospitalized for any cause (including HF hospitalizations), 32 (59.3%) in the SMA group and 25 (67.6%) in the HF clinic group, $P = .421$. Patients were hospitalized up to 6 times for between 1 and 106 days and from 1 to 352 days postconsult. No differences were observed between the groups on any of the all-cause hospitalization outcomes (Table). Group membership did not predict all-cause hospitalization (OR: 0.34, 95% CI: 0.10-1.19), number of all-cause hospitalizations (β: 0.49, SE: 0.41), number of days hospitalized for any cause (β: 5.15, SE: 5.15), or time to first all-cause hospitalization (HR: 0.98, 95% CI: 0.56-1.72), all $P > .05$. None of the covariates predicted any of the all-cause hospitalization outcomes.

All-Cause Mortality Outcomes

During the 12-month follow-up, 14 patients (15%) died of any cause, 8 (15%) in the SMA group and 6 (16%) in the HF clinic group, $P = .856$. Group membership did not predict all-cause mortality (OR: 2.32, 95% CI: 0.44-12.18), and likewise

none of the covariates were associated with 12-month all-cause mortality.

DISCUSSION

This study was a naturalistic, retrospective examination of a HF management program promoting self-management delivered via multidisciplinary SMAs among veterans who enrolled in an acute HF specialty clinic. The authors' hypothesis was not supported: patients who attended the HF SMA clinic did not have lower 12-month hospitalization or mortality rates, shorter hospital stays, or longer time to hospitalization compared with patients in the HF clinic only.

In contrast to the patient-centered approach of this study, a randomized trial delivering a similar disease management program found that patients with acute HF in the SMA group had better short-term (< 7 months) hospitalization outcomes, specifically greater time to first HF-related hospitalization (HR 0.45, 95% CI: 0.21-0.98), but this effect did not last through 12 months when compared with patients in standard care.[6] These disparate findings may be explained by the gap in bench-to-bedside research, where despite scientific evidence indicating better outcomes among patients randomized to an intervention, when patients are given a choice, they may not choose to engage in the best option for their HF treatment.

In the present study, veterans who chose not to attend the HF SMA clinic may have done so for numerous reasons that may have influenced the outcomes. For example, those veterans who did not attend the HF SMA clinic may have had higher health literacy and less need for an educational program. Health literacy has been inversely associated with HF outcomes, such that patients with HF with lower health literacy have greater risk of HF rehospitalization or mortality.[9,10] In addition, many of the veterans who were followed in the HF clinic were taught the same disease management strategies by the NP during one-on-one visits, and they may have gained the same self-management skills in a different setting.

Another possibility is that the veterans enrolled in the HF clinic were less likely to be followed exclusively at the VA and therefore may have had external hospitalizations not recorded in their VA health records. In 2000, more than half the veterans who received health care services at the VA reported that they did not receive their care exclusively at the VA.[11] This may be especially true since the Veteran's Choice Program permits veterans who reside > 40 miles from a VA hospital to receive care closer to home.

Table. Sample Characteristics (N = 91)

Variables	HF SMA Group (n = 54)	HF Clinic Group (n = 37)	*P* Value
Demographics			
Black, n (%)	47 (87.0)	32 (86.5)	.187
Hispanic/Latino, n (%)	3 (5.6)	1 (3.1)	.565
Mean age at consult, y (SD)	67.8 (11.7)	68.9 (12.3)	.687
Nonischemic cardiomyopathy, n (%)	32 (59.2)	28 (75.7)	.105
HFrEF, n (%)	41 (75.9)	28 (75.7)	.978
AF or A-flutter, n (%)	21 (38.9)	15 (40.5)	.874
ICD or pacemaker, n (%)	14 (25.9)	8 (21.6)	.638
Mean no. SMA appointments, n (SD)	4.9 (3.4)	---	---
HF-related hospitalizations			
Hospitalized for HF, n (%)	18 (33.3)	14 (37.8)	.658
Mean no. of hospitalizations, n (SD)[a]	1.8 (0.9)	1.5 (1.0)	.323
Mean length of stay, d (SD)[a]	9.2 (9.5)	9.1 (7.7)	.976
Mean time to first hospitalization, d (SD)[a]	125.4 (97.9)	151.0 (97.7)	.469
All-cause hospitalizations			
Hospitalized for any cause, n (%)	32 (59.3)	25 (67.6)	.421
Mean no. of hospitalizations, n (SD)[a]	1.4 (1.4)	1.7 (1.5)	.533
Mean length of stay, d (SD)[a]	14.4 (17.2)	17.6 (12.8)	.544
Mean time to first hospitalization, d (SD)[a]	122.5 (90.5)	111.8 (101.0)	.676
Mortality			
All-cause mortality, n (%)	8 (14.8)	6 (16.2)	.856

Abbreviations: AF, atrial fibrillation; A-flutter, atrial flutter; HF, heart failure; HFrEF, heart failure with reduced ejection fraction (systolic heart failure); ICD, implantable cardioverter-defibrillator; SMA, shared medical appointment.
[a]Among patients who were hospitalized.

Disease Management Programs

Disease management programs for HF in general promote better outcomes and lower health care expenditures.[5,12] Self-management instruction delivered via SMAs may have greater potential for reducing HF-associated health care costs if it were to be integrated earlier in the continuum of care. The sample in this study was composed of veterans who were referred to a specialty

clinic only after being hospitalized for HF. These patients likely were experiencing more advanced disease and/or low adherence, as indicated by the relatively high prevalence of AF diagnoses and pacemakers; these null findings are consistent with those from a randomized controlled trial of a disease management program among veterans with heavy HF symptom burden and impaired functional status.[13] However, integrating self-management programs earlier in HF clinical care (eg, primary care or cardiology clinics) may be more effective in promoting proactive disease management and delaying or preventing initial HF hospitalizations.

For example, a disease management plan implemented by general practitioners for veterans with HF in Australia was associated with a 23% reduction in potentially preventable hospitalization rates.[14] Veterans with HF enrolled in a NP-led disease management intervention, relative to those followed only in primary care, had significantly fewer hospitalizations and nearly half the risk mortality (15% vs 28% after 2 years; HR 0.55).[15] Furthermore, some have suggested that SMAs may be more effective for patients for whom risk of disease is high but current disease burden (ie, symptoms) is low, such as diabetes mellitus management programs.[16] Early intervention also may allow providers to reach more patients more quickly and before they experience advanced symptoms, thereby reducing specialty clinic wait times and overall health expenditures. Developing more effective disease management programs for patients with acute HF and veterans in particular remains a critical matter for future study.

Additional and novel components of HF management programs show promise for future interventions. First, various facets of social support, including emotional support, instrumental/tangible support, informational support, and appraisal support, are associated with improved self-care.[17] For example, the levels of family functioning and family support predict HF outcomes, perhaps because between-appointment monitoring allows patients to report problems that might otherwise go unidentified and receive more external feedback about their disease and symptoms.[18,19] Patients report that family members or especially supportive members of their health care team are invaluable contributors to their successful management of HF.[20] A recently published feasibility trial of a couple-based disease management program observed positive trends in HF management for veterans, as well as improvements in caregiver's depressive symptoms and burden, indicating that even support from informal caregivers may improve HF outcomes.[21]

Advances in technology-delivered disease management programs show promise in improving adherence to chronic disease management programs.[22,23] Specifically for HF, veterans who enrolled in a daily telehealth intervention employing daily vital signs and symptom reporting, automated reminders and tips for self-management, and proactive monitoring and intervention telephone calls from a nurse successfully lowered their blood pressure, lost weight, reduced their HF medication dosages, and spent 80% fewer days in the hospital.[24] Among patients with coronary artery disease, a text messaging service was shown to improve a number of cardiovascular risk factors.[25] Moreover, mobile applications can be used to support informal caregivers of patients with HF.[26] To the authors knowledge, no research studies have been conducted using text messaging or mobile applications among veterans with HF.

Limitations

Some limitations of the present study warrant discussion. First, as discussed earlier, patients were not randomized to the treatment arms. Second, veterans are referred to the HF clinic only after being hospitalized for HF. As a result, all the referred veterans likely were experiencing more advanced disease and/or low adherence, and these results may not be representative of patients with less advanced disease. Finally, the sample used in the present analysis was a small, homogeneous group of 91 male veterans who were 85% black and 95% non-Hispanic. These demographics are largely representative of the JBVAMC. Therefore, the present results may not be generalizable to more racially or ethnically diverse populations, women, or nonveterans.

CONCLUSION

Minimizing rehospitalization rates for patients with HF continues to be a priority. Health care costs of HF are more than double those of patients in the general population, primarily due to hospitalizations—in 2013, HF hospitalization costs in the U.S. exceeded $10 billion.[27,28] Given the current emphasis on economical, patient-centered care, SMAs may be a cost-effective alternative to individualized disease management plans while continuing to allow providers to tailor treatment to individual patient needs.

Although this study did not find better outcomes among veterans

whose specialty HF care was augmented by clinic-based SMAs, the authors believe that this type of program has great potential. Heart failure SMAs may improve HF outcomes, enhance efficiency of health care delivery, and reduce overall HF-associated health care costs if it is integrated earlier along the continuum of care or if other novel components, such as caregiver support or technology-based delivery, is included. Further studies are needed to systematically evaluate HF management programs delivered via SMAs to improve outcomes and reduce the economic burden that HF places on the health care system. ●

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

Disclaimer

The opinions expressed herein are those of the authors and do not necessarily reflect those of Federal Practitioner*, Frontline Medical Communications Inc., the U.S. Government, or any of its agencies.*

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