Title

Dashboard-Directed Intervention to Improve Guideline-Directed Heart Failure Therapy for Veterans

Journal

JACC Advances, 5(8)

ISSN

2772-963X

Authors

Sheng, Qicong
Brownell, Nicholas K
Hsu, Jeffrey J
et al.

Publication Date

2026-08-01

DOI

10.1016/j.jacadv.2026.103007

Peer reviewed

JACC: ADVANCES VOL. 5, NO. 8, 2026

ORIGINAL RESEARCH

Dashboard-Directed Intervention to Improve Guideline-Directed Heart Failure Therapy for Veterans

Qicong Sheng, MD,[a] Nicholas K. Brownell, MD, PhD,[b,c] Jeffrey J. Hsu, MD, PhD,[b,c] Donald S. Chang, MD,[b,c] Gregg C. Fonarow, MD,[b,c] Boback Ziaeian, MD, PhD[b,c]

ABSTRACT

BACKGROUND Significant gaps in guideline-directed medical therapy (GDMT) persist in patients with heart failure (HF) with reduced ejection fraction (HFrEF). Although population health dashboards can identify these gaps, sustainable workflows integrating them into routine practice remain largely underutilized.

OBJECTIVES This study aimed to evaluate the implementation and outcomes of a dashboard-based intervention in a novel clinical-educational hybrid model aimed to improve GDMT use.

METHODS From July 2024 to June 2025, a weekly, half-day HF Dashboard Population Health Clinic was implemented at a single Veterans Affairs center. A supervised team of cardiology fellows and nurse practitioners performed medical record reviews of patients with gaps in GDMT identified on the Veterans Affairs HF Dashboard, with a focus on underutilization of sodium-glucose cotransporter 2 inhibitors (SGLT2i) in HFrEF patients. Clinicians executed targeted telehealth interventions, initiated therapies, and coordinated follow-up. Outcomes were measured via an optimization score for each GDMT component (0 = none, 1 = low dose, 2 = target dose).

RESULTS Over 1 year, 163 patients received the Dashboard Clinic intervention; 128 (78.5%) had HFrEF and 150 (92.0%) were not receiving SGLT2i therapy. In 79 patients (48.5%), GDMT was initiated via telephone or recommended for initiation. In patients who qualified for GDMT optimization (N = 107), the composite optimization score increased from 2.10 (SD = 1.88) before intervention to 2.81 (SD = 2.17) after intervention ($P = 0.018$), and the OS of SGLT2i therapy increased from 0.40 (SD = 0.80) to 0.74 (SD = 0.97) ($P = 0.013$).

CONCLUSIONS The Dashboard Clinic is a viable and potentially effective intervention for GDMT optimization, providing a scalable blueprint for dashboard-directed care. (JACC Adv. 2026;5:103007) Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Heart failure (HF) is a prevalent chronic condition in the United States, affecting over 6.7 million American adults, with its prevalence projected to increase to more than 8 million by 2030.[1] Furthermore, HF is a leading cause of hospitalization for adults in the United States.[2] The overall prognosis for HF is unfavorable, with the 5-year mortality rate reaching 75% after initial hospitalization.[3]

From the [a]Department of Medicine, University of California, Los Angeles, Los Angeles, California, USA; [b]Division of Cardiology, Department of Medicine, University of California, Los Angeles, Los Angeles, California, USA; and the [c]Division of Cardiology, VA Greater Los Angeles Healthcare System, Los Angeles, California, USA.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

Manuscript received March 16, 2026; revised manuscript received June 2, 2026, accepted June 17, 2026.

ISSN 2772-963X https://doi.org/10.1016/j.jacadv.2026.103007

ABBREVIATIONS AND ACRONYMS

ACEi = angiotensin-converting enzyme inhibitor

ARB = angiotensin II receptor blocker

ARNI = angiotensin receptor neprilysin inhibitors

GDMT = guideline-directed medical therapy

HF = heart failure

HFrEF = heart failure with reduced ejection fraction

LVEF = left ventricular ejection fraction

MRA = mineralocorticoid receptor antagonists

OS = optimization score

SGLT2i = sodium glucose cotransporter-2 inhibitors

VA = Veterans Affairs

The establishment of guideline-directed medical therapy (GDMT), namely beta blockers, angiotensin-converting enzyme inhibitors (ACEIs) angiotensin II receptor blockers (ARBs) or angiotensin receptor neprilysin inhibitors (ARNI), mineralocorticoid receptor antagonists (MRA), and sodium glucose cotransporter-2 inhibitors (SGLT2i), is central to HF treatment.[4] When used together and optimized, the 4 pillars of GDMT may reduce the risk of death by 73% over 2 years.[5] Despite the proven efficacy of GDMT, a significant implementation gap persists in real-world clinical practices. It has been previously shown that <1% of eligible patients with HF with reduced ejection fraction (HFrEF) were prescribed all 4 foundational medication classes at target doses, highlighting large potential opportunities for therapy optimization.[6]

The Veterans Affairs (VA) Academic Detailing HF Dashboard was developed and released in 2020 as a tool for clinicians to track patients with HF and identify potential treatment opportunities. The dashboard underwent informatics algorithm optimization (Dashboard 2.0) in 2023, with substantial improvement in its accuracy in identifying patients with HF.[7] Although digital health tools like the HF Dashboard have been developed to track patients and identify potential treatment opportunities, the mere presence of a dashboard is insufficient to drive clinical change. A critical gap exists in implementation science regarding how to operationalize these informatics tools into sustainable clinical workflows. In 2022, a randomized clinical trial named DASH-HF (Dashboard Activated Services and Telehealth for HF) was conducted at the Greater Los Angeles VA to evaluate telehealth clinics directed by the HF Dashboard to optimize GDMT of patients with HF.[8] Although DASH-HF was a small, single-site pilot trial that did not meet its primary outcome, it demonstrated important qualitative improvements in care delivery for patients with HFrEF, especially those lost to specialty care follow-up.

Building upon the DASH-HF study, we designed and implemented a novel HF Dashboard Population Health Clinic in a sustainable clinical-educational hybrid model for cardiology fellows and advanced practice nurse practitioners to target HFrEF patients with gaps in GDMT. The clinic is a weekly, half-day clinic at the Greater Los Angeles VA. Clinicians work at their own pace for a half-day, reviewing patients identified by the dashboard with gaps in GDMT. For the first year, clinicians were encouraged to focus on HFrEF patients with gaps in SGLT2i, given its low uptake in the VA system, but also to review all indicated HF therapies during their clinic.[9] This study investigated the implementation and outcomes of the Dashboard Clinic as a blueprint for GDMT optimization.

METHODS

PATIENTS. Patients at Greater Los Angeles VA identified by the VA HF Dashboard as requiring GDMT optimization were included as potential candidates for the Dashboard Clinic. The VA HF Dashboard structures American College of Cardiology/American Heart Association guidelines into performance measures and highlights patients with GDMT gaps using hierarchical inclusion and exclusion criteria.[7] Specifically, potential ACEI/ARB/ARNI and beta-blocker gaps were highlighted in patients with HFrEF and HF with mid-range ejection fraction (left ventricular ejection fraction [LVEF] <50%), MRA gaps were highlighted in patients with HFrEF (LVEF ≤40%), and SGLT2i gaps were highlighted in patients with HFrEF, HF with mid-range ejection fraction, and HF with preserved ejection fraction (regardless of LVEF). The project was determined to be quality improvement and received exemption from full Institutional Review Board review through the VA Electronic Determination Aid.

DASHBOARD CLINIC INTERVENTION. The Dashboard Clinic was a weekly half-day clinic at the Greater Los Angeles VA from July 1, 2024, to June 30, 2025, staffed by 25 rotating cardiology fellows and 1 nurse practitioner at University of California, Los Angeles. Each fellow was scheduled to complete 1 half-day of Dashboard Clinic each week, which was staffed with a supervising attending. During this clinic, the fellows and nurse practitioner identified actionable patients on the HF Dashboard with possible deficiencies in the use of GDMT and conducted chart reviews at their own pace. The fellows and nurse practitioner were encouraged to prioritize the review of patients with HFrEF with SGLT2i underutilization. This prioritization was driven by institutional data demonstrating historically low uptake of SGLT2i within the VA health care system (49.9% uptake of SGLT2i, compared to 73.2% uptake of beta-blockers and 70.9% uptake of ACEi/ARB/ARNI in all eligible HFrEF patients at Greater Los Angeles VA, per VA HF Dashboard data in June 2024). Although SGLT2i was the primary educational and interventional target, clinicians retained full flexibility to review and optimize all indicated HF therapies across the 4 pillars of GDMT. Because dashboard

algorithms may rely on historical or incomplete data, the actual HF phenotype was adjudicated by the clinicians through a manual chart review of echocardiographic reports in the electronic medical record. If patients were likely to benefit from GDMT optimization, contact was attempted immediately; if the patient could be reached, a telehealth visit was initiated, and the patient was started on appropriate therapy over the phone, with applicable labs, imaging, and return visits recommended or arranged. If the patient could not be contacted during the clinic, recommendations were relayed to their primary care team via a co-signed note, and follow-up with cardiology was requested if appropriate. Regardless of contact, a note was placed in the electronic health record to document this intervention.

DATA COLLECTION. All patients who received the Dashboard Clinic intervention were chart reviewed. From chart reviews of fellows' and nurse practitioner's notes, we recorded the GDMT underutilization identified by the dashboard, the HF phenotype identified by the dashboard, and the actual HF phenotype on manual review. We also recorded the following information: whether the dashboard identified the correct HF phenotype, whether there was a part of GDMT underutilization marked inappropriately by the dashboard, and intervention provided if there was a GDMT underutilization (eg, phone call, co-signed recommendation to primary care team, return-to-clinic orders, medication recommendation, lab recommendation, imaging recommendation). Also, housing insecurity, active substance use disorder, and active psychiatric conditions were chart reviewed. Active prescription data of GDMT were captured on July 1, 2024 (before the start of Dashboard Clinic intervention) and on July 31, 2025 (1 month after the Dashboard Clinic intervention ended) for each patient.

OUTCOMES. For each patient, an optimization score (OS) was calculated for each component of GDMT using the prescription data on July 1, 2024 (before intervention), and July 31, 2025 (after intervention). The OS is scored based on whether the patient is on medication and at the target dose used in landmark clinical trials (Supplemental Table 1).[8,10-12] For each component of GDMT, a score of 2 indicates the patient is on the target dose, a score of 1 indicates the patient is on a low dose, and a score of 0 indicates the patient is not on medication. A total score of 8 indicates maximal optimization of all 4 components of GDMT, and a total score of 0 indicates the patient is not on any GDMT. In addition, the use rates of each component of GDMT were also recorded and compared before and after the intervention. The all-cause hospitalization, HF hospitalization, and death of patients who received the Dashboard Clinic intervention were also recorded and compared between those who were and were not successfully contacted.

STATISTICAL ANALYSIS. All continuous variables were summarized as mean (SD), and categorical variables were summarized as count (percentage). Differences between variables were assessed using paired or independent t tests or chi-square test/Fisher exact test as appropriate. Missing data in baseline characteristics were removed from the comparison. A significance threshold of $P < 0.05$ was used for all analyses. The statistical analysis was conducted in Microsoft Excel.

RESULTS

PATIENTS. A total of 163 patients received the Dashboard Clinic intervention over 1 year, from July 1, 2024, to June 30, 2025. Of the 163 patients, 128 (78.5%) had HFrEF, 11 (6.7%) had HF with mid-range ejection fraction, 12 (7.4%) had HF with preserved ejection fraction, 9 (5.5%) had HF with improved ejection fraction, 2 (1.2%) had no HF, and 1 (0.6%) had an unknown status of HF per manual chart review. At the time of intervention, 150 were marked deficient in the use of SGLT2i, 53 were marked deficient in the use of ACEi/ARB/ARNI, 44 were marked deficient in the use of beta blockers, and 64 were marked deficient in the use of MRA. Compared to the rest of Greater Los Angeles VA patients on the HF Dashboard (N = 2,753), the patients who received the Dashboard Clinic intervention were more likely to have existing coronary artery disease, chronic obstructive pulmonary disease, chronic kidney disease, housing insecurity, and stimulant use disorder (**Table 1**).

INTERVENTION IMPLEMENTATION. Of the 163 patients, 133 were reviewed by 25 rotating cardiology fellows and 30 were reviewed by 1 nurse practitioner. 79 (48.5%) patients had GDMT started or had a recommendation for initiation communicated to a primary care provider or cardiologist. 57 (35.0%) had labs ordered or recommended, and 37 (22.7%) had imaging ordered or recommended. 71 (43.6%) patients had notes co-signed to a primary care provider or specialist, or had letters mailed to patients. 61 (37.4%) patients had a return-to-clinic order or cardiology referral placed. In 85 of 163 patients (52.1%), a phone call was attempted (**Figure 1**). Compared to patients who were successfully contacted through a phone call (N = 48), those who were unable to be contacted (N = 37) were more likely to be Black, have

TABLE 1 Baseline Characteristics of Patients

	Intervention (n = 163)	All Remaining Dashboard Patients (n = 2,753)	*P* Value
Age (years)	74.4 (10.7)	74.4 (11.0)	0.952
Sex (male)	161 (98.8%)	2,671 (97.0%)	0.290
Race/ethnicity			**0.015**
White	79 (48.5%)	1,205 (43.9%)	
Black or African American	58 (35.6%)	798 (29.0%)	
Hispanic or Latino	9 (5.5%)	283 (10.3%)	
Other/unknown	17 (10.4%)	467 (17.0%)	
Coronary artery disease	102 (62.6%)	1,422 (51.7%)	**0.007**
Cardiac dysrhythmia	89 (54.6%)	1,420 (51.6%)	0.450
COPD	78 (47.9%)	965 (35.1%)	**<0.001**
Chronic kidney disease	84 (51.5%)	1,117 (40.6%)	**0.006**
Diabetes mellitus	79 (48.5%)	1,381 (50.2%)	0.671
Systolic blood pressure	123.6 (22.0)	126.9 (19.1)	0.061
Heart rate	77.5 (12.9)	73.6 (13.6)	**<0.001**
Body mass index	27.9 (6.6)	30.0 (8.6)	**<0.001**
eGFR	62.8 (25.2)	64.8 (23.6)	0.339
BNP	421.5 (677.6)	267.4 (562.5)	**0.019**
NT-proBNP	2,462.2 (3,689.2)	1874.1 (6,423.5)	0.547
Potassium	4.4 (0.5)	4.4 (0.4)	0.740
LVEF			
LVEF <50%	139 (85.6%)	890 (32.3%)	**<0.001**
LVEF ≤40%	128 (78.5%)	579 (21.0%)	**<0.001**
LVEF 41%-49%	11 (6.7%)	311 (11.3%)	0.072
LVEF ≥50%	21 (12.9%)	1,035 (37.6%)	**<0.001**
Unknown	3 (1.8%)	828 (30.1%)	**<0.001**
Patients with GDMT underutilization			
LVEF <50% and not on ACEi/ARB/ARNI	53/139 (38.1%)	263/890 (29.6%)	**0.043**
LVEF <50% and not on beta-blockers	44/139 (31.7%)	191/890 (21.5%)	**0.008**
LVEF ≤40% and not on MRA	64/128 (50.0%)	319/579 (55.1%)	0.290
LVEF <50% and not on SGLT2i	128/139 (92.1%)	378/890 (42.5%)	**<0.001**
LVEF ≥50% and not on SGLT2i	20/21 (95.2%)	674/1,035 (65.1%)	**0.004**
Housing insecurity	50 (30.7%)	515 (18.7%)	**<0.001**
Stimulant use disorder	40 (24.5%)	278 (10.1%)	**<0.001**

Comparison between all who received the Dashboard Clinic intervention (N = 163) and all other patients on Heart Failure Dashboard as of July 2025 excluding patients who received the intervention (N = 2,753). Cardiac dysrhythmia includes paroxysmal tachycardia, atrial fibrillation and flutter, and ventricular arrhythmia. For data presentation, n (%) or mean (SD) is used. **Bold** values are highlighting the significant *P* value < 0.05.

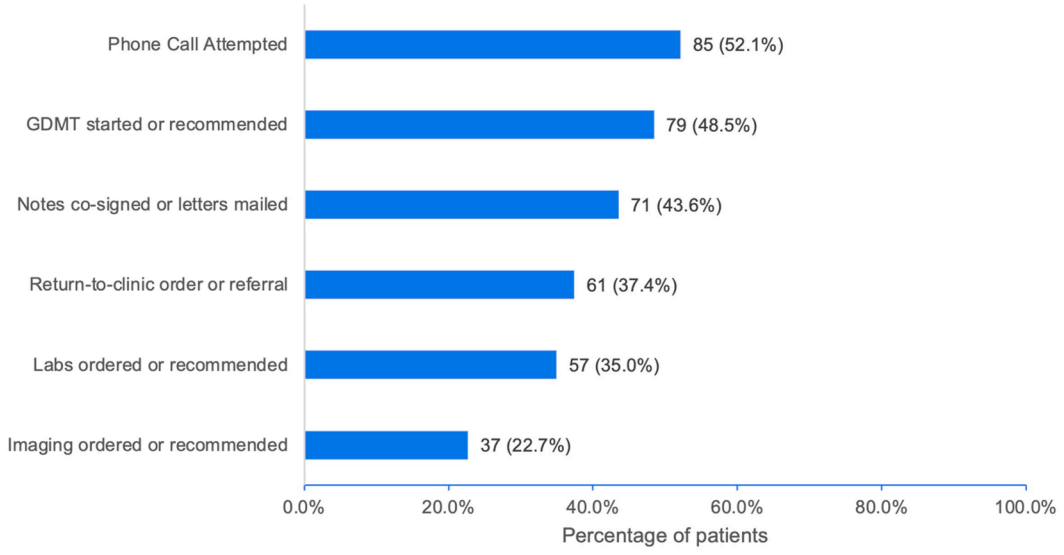
ACEi/ARB = angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers; ARNI = angiotensin receptor neprilysin inhibitors; BNP = B-type natriuretic peptide; COPD = chronic obstructive pulmonary disease; eGFR = estimated glomerular filtration rate; GDMT = guideline-directed medical therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; LVEF = left ventricular ejection fraction; MRA = mineralocorticoid receptor antagonists; NT-pro BNP = N-terminal pro-B-type natriuretic peptide; SGLT2i = sodium glucose cotransporter-2 inhibitors.

housing insecurity, active substance use, or active psychiatric conditions (Table 2).

The dashboard marked 50 patients (30.7%) as having housing insecurity and 40 patients (24.5%) as having stimulant use disorders. Based on our manual chart review, 36 (22.1%) had housing insecurity, 35 (21.5%) had active substance use, and 44 (27.0%) had active psychiatric conditions (Table 2).

The dashboard correctly identified the HF phenotype in 148 of the 163 patients (90.8%). The dashboard appropriately identified GDMT underutilization in 107 of the 163 patients (65.6%). However, a GDMT underutilization was inappropriately marked in 74 of the 163 patients (44.8%). An overlap exists where some patients had partially appropriately and partially inappropriately marked GDMT status. Among 74 reviewed patients who were inappropriately marked as deficient in GDMT use, 39 (52.7%) had prior intolerance to GDMT, 14 (18.9%) had misclassified HF phenotypes by the dashboard, 14 (18.9%) had an expired medication prescription or were on non-VA medication not recorded in the electronic medical record, 4 (5.4%) were on hospice or had died, and 3 (4.1%) had renal impairment not captured by the dashboard. Among the 39 patients with prior intolerance to GDMT, there were 26 instances of SGLT2i intolerance due to genitourinary infections or other urological issues, 21 instances of ACEi/ARB/ARNI,

FIGURE 1 Clinical Actions Done for Intervention Patients



Numbers and percentages of different clinical actions initiated for patients who received the Dashboard Clinic intervention (N = 163). GDMT = guideline-directed medical therapy.

SGLT2i, or beta blocker intolerance due to hemodynamic instability (hypotension, bradycardia), and 5 instances of MRA intolerance due to hyperkalemia or dizziness. Note that some patients experienced multiple intolerances, so the number of instances is greater than the number of patients.

OUTCOMES. In all patients who qualified for GDMT optimization (N = 107), the average composite OS after intervention was 2.81 (SD = 2.17), which was significantly higher than the average composite OS before intervention of 2.10 (SD = 1.88) (P = 0.018). The average OS of SGLT2i increased from 0.40 (SD = 0.80) to 0.74 (SD = 0.97) (P = 0.013) after intervention. In all patients with LVEF ≤40% who qualified for GDMT optimization (N = 86), the average composite OS after intervention was 3.09 (SD = 2.21), which was significantly higher than the average composite OS before intervention of 2.27 (SD = 1.90) (P = 0.023). The average OS of SGLT2i among patients with LVEF ≤40% increased from 0.42 (SD = 0.82) to 0.83 (SD = 0.99) (P = 0.015) after intervention (Table 3).

In all patients who received the Dashboard Clinic intervention (N = 164), the use rate of SGLT2i increased from 19.6% before intervention (per prescription data on July 1, 2024) to 31.1% after intervention (per prescription data on July 31, 2025) (P = 0.043). The use rate of all 4 GDMT ("quadruple therapy") increased from 4.3% to 13.4% (P = 0.013). In patients who qualified for GDMT optimization (N = 107), the use rate of SGLT2i increased from 18.9% before intervention to 36.3% after intervention (P = 0.015), the use rate of at least 3 GDMT ("triple therapy") increased from 20.0% to 36.3% (P = 0.025), and the use rate of all 4 GDMT ("quadruple therapy") increased from 4.4% to 18.8% (P = 0.003) (Table 4).

Of all 163 patients who received the Dashboard Clinic intervention, there were 214 all-cause hospitalizations and 39 HF hospitalizations between July 1, 2024, and July 31, 2025. A total of 19 patients died by the end of the intervention as of July 31, 2025. There was no statistical difference in mortality rate, all-cause hospitalization, or HF hospitalization between those with successful contact and those with unsuccessful contact (Table 2). The median (Q1, Q3) duration of follow-up for all-cause death was 7.0 months (3.3 months, 9.3 months) (Central Illustration).

DISCUSSION

The VA HF Dashboard is one of the largest and highest-quality population health dashboards. Our study demonstrated a significant improvement in the overall GDMT optimization for patients who underwent the Dashboard Clinic intervention. As our intervention focused on SGLT2i optimization for HFrEF patients given the low uptake of SGLT2i

TABLE 2 Comparison Among Patients With and Without Successful Contact

	Successful Contact (n = 48)	Unsuccessful Contact (n = 37)	All Intervention Group (n = 163)	*P* Value (Successful Contact vs Unsuccessful Contact)
Age (years)	72.7 (10.2)	70.9 (10.7)	74.4 (10.7)	0.44
Sex (male)	48 (100%)	36 (97.3%)	161 (98.8%)	**<0.001**
Race/ethnicity				
White	29 (60.4%)	15 (40.5%)	79 (48.5%)	0.11
Black or African American	9 (18.8%)	15 (40.5%)	58 (35.6%)	**0.049**
Hispanic or Latino	3 (6.3%)	3 (8.1%)	9 (5.5%)	1.0
Other/unknown	10 (20.8%)	4 (10.8%)	17 (10.4%)	0.347
Housing insecurity by chart review	6 (12.5%)	16 (43.2%)	36 (22.1%)	**0.003**
Active substance use by chart review	6 (12.5%)	16 (43.2%)	35 (21.5%)	**0.003**
Active psychiatric conditions by chart review	8 (16.7%)	15 (40.5%)	44 (27.0%)	**0.027**
Housing insecurity by dashboard	9 (18.8%)	17 (45.9%)	50 (30.7%)	**0.014**
Stimulant use disorder by dashboard	11 (22.9%)	13 (35.1%)	40 (24.5%)	0.318
All hospitalizations	0 (0, 1)	0 (0, 1)	0 (0, 1.5)	0.999
HF hospitalizations	0 (0, 0)	0 (0, 0)	0 (0, 0)	0.390
Death	4 (8.3%)	2 (5.4%)	19 (11.7%)	0.693

Patients were indicated for GDMT optimization and phone calls were attempted. All hospitalizations, HF hospitalizations, and death outcomes were captured during the time period from July 1, 2024, and July 31, 2025. For data presentation, n (%), mean (SD), or median (Q1, Q3) is used. **Bold** values are highlighting the significant *P* value < 0.05.

within the VA system as shown in our study and previous literature, we also observed significant improvement in SGLT2i optimization for patients with LVEF ≤40% at the end of the intervention.[9] In keeping with positive results from previous studies that used other digital health tools to optimize GDMT, our results successfully demonstrated the viability and potential effectiveness of this novel Dashboard Clinic model and are encouraging that similar dashboard-directed interventions could potentially improve HF outcomes.[13,14] The benefit of the Dashboard Clinic compared to traditional clinical care lies in its shift from reactive, visit-based care to proactive population health management. Our intervention captured patients lost to follow-up or managed outside of the VA, while serving as an audit and reminder for guideline-directed care.

Our Dashboard Clinic directly builds upon the groundwork laid by the previous DASH-HF study.[8] Although not meeting its primary outcome, the DASH-HF study demonstrated a trend for reduced mortality with intervention, despite the low number of events. Qualitatively, the intervention in DASH-HF proved to be an effective method for reengaging HF patients who were lost to follow-up, and patients expressed deep appreciation that the clinicians were proactive about their care. Our study addresses the primary limitations of DASH-HF regarding sustainability. Whereas DASH-HF was a standalone, randomized trial, our Dashboard Clinic intervention utilizes a clinical-educational hybrid model by embedding dashboard management into the standard workflow of 25 rotating cardiology fellows. It serves as a blueprint for dashboard-directed interventions that incorporate hands-on training in population health management.

The previous DASH-HF study revealed that patients with the most severe GDMT gaps often faced compounding psychosocial challenges, which cannot be adequately resolved through telehealth nudges alone. Our study also found that patients with housing insecurity, active substance use, or active psychiatric conditions were less likely to be successfully contacted. Those with successful contact were associated with a significant treatment effect compared to the control group in a post hoc analysis in DASH-HF, suggesting that successful direct patient contact may be crucial in dashboard-based GDMT optimization.[8] This indicates that although dashboard-directed telehealth could effectively overcome access barriers for a standard cohort, it might be insufficient for the most socially vulnerable subgroups. These populations likely require additional intensive, multidisciplinary services to achieve meaningful GDMT optimization.

Given these lessons from the DASH-HF, our current implementation shifted focus away from outreach based on maximum GDMT gaps and towards optimization of SGLT2i, a newer, easy-to-manage, yet often overlooked therapy. The targeted focus on SGLT2i provided insights into addressing specific clinical barriers. For instance, detailed chart reviews revealed that a history of urinary incontinence or urinary tract infections was frequently cited

TABLE 3 GDMT Optimization Score of Patients Before Intervention (on July 1, 2024) Versus After Intervention (on July 31, 2025)

	Before Intervention	After Intervention	*P* Value
All patients who received dashboard clinic intervention (N = 163)			
Composite OS (mean [SD])	2.24 (1.91)	2.67 (2.13)	0.065
SGLT2i OS	**0.39 (0.80)**	**0.62 (0.93)**	**0.019**
Beta blockers OS	0.64 (0.69)	0.75 (0.65)	0.083
ACE/ARB/ARNI OS	0.66 (0.75)	0.65 (0.63)	0.555
MRA OS	0.55 (0.90)	0.66 (0.94)	0.375
All patients who qualified for GDMT optimization (N = 107)			
Composite OS	**2.10 (1.88)**	**2.81 (2.17)**	**0.018**
SGLT2i OS	**0.40 (0.80)**	**0.74 (0.97)**	**0.013**
Beta blockers OS	0.67 (0.67)	0.77 (0.64)	0.095
ACE/ARB/ARNI OS	0.60 (0.70)	0.67 (0.59)	0.877
MRA OS	0.44 (0.84)	0.64 (0.94)	0.181
Patients with LVEF ≤40% who qualified for GDMT optimization (N = 86)			
Composite OS	**2.27 (1.90)**	**3.09 (2.21)**	**0.023**
SGLT2i OS	**0.42 (0.82)**	**0.83 (0.99)**	**0.015**
Beta blockers OS	0.70 (0.68)	0.80 (0.62)	0.109
ACE/ARB/ARNI OS	0.63 (0.68)	0.72 (0.57)	0.606
MRA OS	0.51 (0.88)	0.74 (0.97)	0.255
Patients with LVEF 41%-49% who qualified for GDMT optimization (N = 10)			
Composite OS	1.60 (1.26)	1.50 (0.53)	0.598
SGLT2i OS	0.20 (0.63)	0.25 (0.71)	0.351
Beta blockers OS	0.80 (0.63)	0.63 (0.52)	0.598
ACE/ARB/ARNI OS	0.50 (0.85)	0.63 (0.74)	1.000
Patients with LVEF ≥50% who qualified for GDMT optimization (N = 11)			
Composite OS [mean (SD)]	1.33 (2.12)	1.88 (2.23)	0.689
SGLT2i OS	0.44 (0.88)	0.50 (0.93)	1.000

For data presentation, mean (standard deviation) is used. **Bold** values are highlighting the significant *P* value < 0.05.
OS = optimization score; other abbreviations as in Table 1.

as a reason for SGLT2i omission. Although not strict contraindications in the absence of genitourinary mycotic infections, these documented histories reflect real-world clinician hesitancy. Through this clinical intervention, fellows are empowered to navigate these specific nuances in GDMT optimization.

Although there is extensive literature that uses large data and electronic health record rules to evaluate gaps in GDMT in patients with HF, it rarely explores the reasons behind those gaps.[15,16] Through detailed chart reviews, our study found limitations and barriers in the identification of GDMT gaps with electronic health records. Specifically, 44.8% of dashboard-flagged deficiencies were inappropriate for optimization due to factors like prior medication intolerances, misclassified ejection fraction, or transitions to hospice care. Also, the dashboard's informatics-based rules make accurate HF phenotyping imperfect. Notwithstanding these limitations, health systems should prioritize the development of HF population-based strategies to address care gaps tailored to their specific patient populations and institutional needs.

STUDY LIMITATIONS. Our study has several limitations. First, the calculation of GDMT OS relied on prescription data at single time points, which may not reflect actual GDMT adherence. In addition, we observed the longitudinal progression of patients' GDMT prescription status, which could be affected by general trends, including improvement of overall GDMT prescription in the population, but could also be negatively affected as HF progresses and patients are less tolerant of GDMT due to complications. There was no randomized concurrent control, and the changes in GDMT use observed may have been influenced by factors other than the Dashboard Clinic intervention.

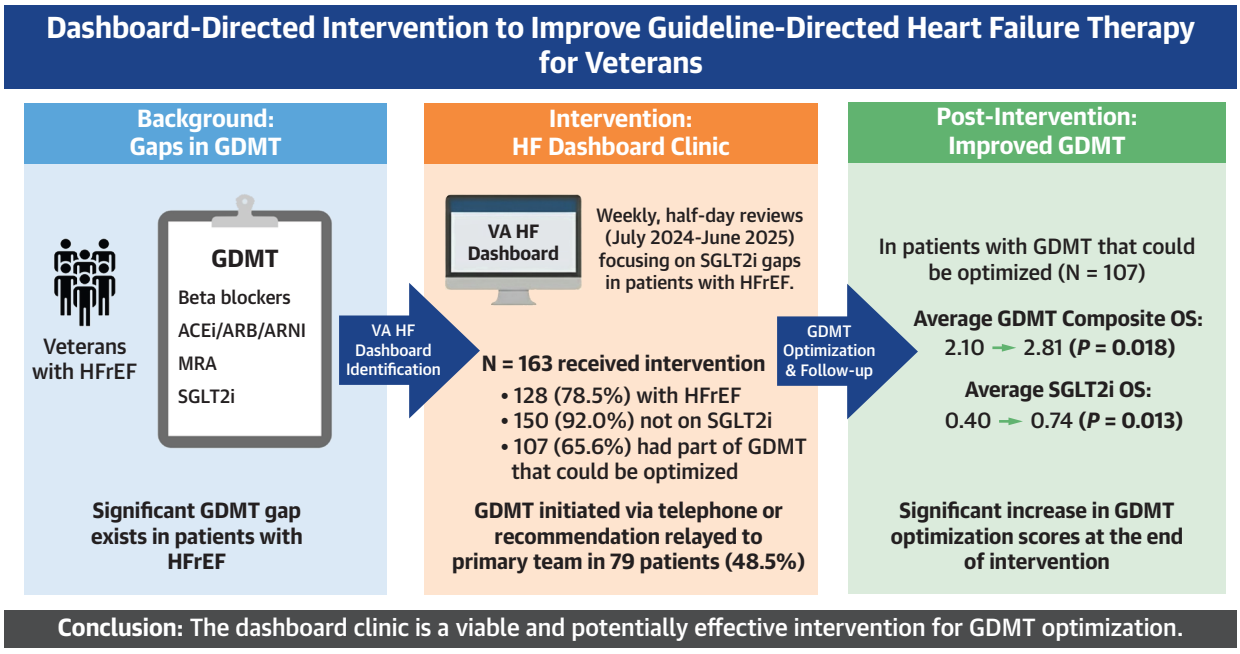
TABLE 4 The Use Rate of Individual GDMT, Triple Therapy, and Quadruple Therapy

	Before Intervention (Nonmissing n = 138)	After Intervention (Nonmissing n = 119)	*P* Value
All patients who received dashboard clinic intervention (N = 163)			
On SGLT2i	27 (19.6%)	37 (31.1%)	**0.043**
On beta blockers	72 (52.2%)	75 (63.0%)	0.100
On ACE/ARB/ARNI	68 (49.3%)	69 (58.0%)	0.170
On MRA	38 (27.5%)	38 (31.9%)	0.494
On at least 3 GDMT	29 (21.0%)	38 (31.9%)	0.064
On all 4 GDMT	6 (4.3%)	16 (13.4%)	**0.013**
	Before Intervention (Nonmissing n = 90)	**After Intervention (Nonmissing n = 80)**	***P* Value**
All patients who qualified for GDMT optimization (N = 107)			
On SGLT2i	17 (18.9%)	29 (36.3%)	**0.015**
On beta-blockers	49 (54.4%)	53 (66.3%)	0.158
On ACE/ARB/ARNI	41 (45.6%)	49 (61.3%)	**0.046**
On MRA	19 (21.1%)	25 (31.3%)	0.161
On at least 3 GDMT	18 (20.0%)	29 (36.3%)	**0.025**
On all 4 GDMT	4 (4.4%)	15 (18.8%)	**0.003**

The prescription status was determined based on prescription data collected before intervention (on July 1, 2024) and after intervention (on July 31, 2025) for all patients who received intervention and those who qualified for GDMT optimization. Cases with missing prescription data were removed. For data presentation, n (%) is used. **Bold** values are highlighting the significant *P* value < 0.05.

Abbreviations as in Table 1.

CENTRAL ILLUSTRATION Project Overview



Sheng Q, et al. JACC Adv. 2026;5(8):103007.

For the OS of individual GDMT, a score of 2 indicates the patient is on the target dose, a score of 1 indicates the patient is on a low dose, and a score of 0 indicates the patient is not on medication. For the composite OS, a total score of 8 indicates maximal optimization of all 4 components of GDMT, and a total score of 0 indicates the patient is not on any GDMT. ACEi/ARB = angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers; ARNI = angiotensin receptor neprilysin inhibitors; GDMT = guideline-directed medical therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; MRA = mineralocorticoid receptor antagonists; OS = optimization score; SGLT2i = sodium glucose cotransporter-2 inhibitors; VA = Veterans Affairs.

As a pilot run of the Dashboard Clinic intervention program, our study was inherently underpowered to detect differences in hard clinical endpoints. Although our intervention successfully improved GDMT OSs, we observed no statistically significant differences in all-cause mortality or hospitalization rates between patients with successful vs unsuccessful contact, given the small sample sizes of the contact subgroups (N = 48 successful vs N = 37 unsuccessful). Future studies are needed to assess the long-term effects of these programs including on patient-centered outcomes.

CONCLUSIONS

The VA HF Population Health Management Clinic represents a viable and potentially effective intervention for improving GDMT optimization in patients with HF, offering a scalable blueprint for dashboard-directed care within a clinical-educational hybrid model. This study also identified key limitations of the HF Dashboard and patient-level psychosocial barriers that must be addressed to further advance the optimization process.

FUNDING SUPPORT AND AUTHOR DISCLOSURES

Dr Fonarow reports consulting for Abbott, Amgen, AstraZeneca, Bayer, Boehringer Ingelheim, Cytokinetics, Eli Lilly, Janssen, Medtronic, Merck, Novartis, and Pfizer. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

ADDRESS FOR CORRESPONDENCE: Dr Boback Ziaeian, Division of Cardiology, University of California, Los Angeles, Division of Cardiology, VA Greater Los Angeles Healthcare System, 1301 Wilshire Blvd, 111E, Los Angeles, California 90073, USA. E-mail: BZiaeian@mednet.ucla.edu.

PERSPECTIVES

COMPETENCY IN SYSTEMS-BASED PRACTICE: Our study highlights substantial future opportunities for integrating digital population health tools in clinical-educational hybrid models with clinical workflows to improve HF outcomes while providing a training experience in population health management.

TRANSLATIONAL OUTLOOK: Future efforts will need to partner with multidisciplinary teams to develop effective interventions targeting psychosocial barriers, such as housing insecurity and substance use, which are major impediments to optimal cardiovascular care. Larger-scale trials of dashboard-based interventions should also be conducted to evaluate the cost of implementation relative to any improvements in clinical outcomes such as hospitalization and mortality risk.

REFERENCES

1. Martin SS, Aday AW, Allen NB, et al. 2025 heart disease and stroke statistics: a report of US and global data from the American Heart Association. *Circulation*. 2025;151(8):e41-e660. https://doi.org/10.1161/CIR.0000000000001303

2. Agarwal MA, Fonarow GC, Ziaeian B. National trends in heart failure hospitalizations and readmissions from 2010 to 2017. *JAMA Cardiol*. 2021;6(8):952-956. https://doi.org/10.1001/jamacardio.2020.7472

3. Shah KS, Xu H, Matsouaka RA, et al. Heart failure with preserved, borderline, and reduced ejection fraction: 5-year outcomes. *J Am Coll Cardiol*. 2017;70(20):2476-2486. https://doi.org/10.1016/j.jacc.2017.08.074

4. Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA guideline for the management of heart failure: a report of the American College of Cardiology/American Heart Association Joint Committee on clinical practice guidelines. *Circulation*. 2022;145(18):e895-e1032. https://doi.org/10.1161/CIR.0000000000001063

5. Greene SJ, Butler J, Fonarow GC. Simultaneous or rapid sequence initiation of quadruple medical therapy for heart failure-optimizing therapy with the need for speed. *JAMA Cardiol*. 2021;6(7):743-744. https://doi.org/10.1001/jamacardio.2021.0496

6. Greene SJ, Butler J, Albert NM, et al. Medical therapy for heart failure with reduced ejection fraction: the CHAMP-HF registry. *J Am Coll Cardiol*. 2018;72(4):351-366. https://doi.org/10.1016/j.jacc.2018.04.070

7. Brownell N, Kay C, Parra D, et al. Development and optimization of the veterans affairs' national heart failure dashboard for population health management. *J Card Fail*. 2024;30(3):452-459. https://doi.org/10.1016/j.cardfail.2023.08.024

8. Verma A, Fonarow GC, Hsu JJ, et al. DASH-HF study: a pragmatic quality improvement randomized implementation trial for patients with heart failure with reduced ejection fraction. *Circ Heart Fail*. 2023;16(9):e010278. https://doi.org/10.1161/CIRCHEARTFAILURE.122.010278

9. Varshney AS, Calma J, Kalwani NM, et al. Uptake of sodium-glucose Cotransporter-2 inhibitors in hospitalized patients with heart failure: insights from the veterans affairs healthcare system. *J Card Fail*. 2024;30(9):1086-1095. https://doi.org/10.1016/j.cardfail.2023.12.018

10. DeFilippis EM, Fiuzat M. Putting the "Optimal" in optimal medical therapy. *JACC Heart Fail*. 2021;9(1):39-41. https://doi.org/10.1016/j.jchf.2020.08.016

11. Fiuzat M, Hamo CE, Butler J, et al. Optimal background pharmacological therapy for heart failure patients in clinical trials: JACC review topic of the week. *J Am Coll Cardiol*. 2022;79(5):504-510. https://doi.org/10.1016/j.jacc.2021.11.033

12. Johansen ND, Vaduganathan M, Zahir D, et al. A composite score summarizing use and dosing of evidence-based medical therapies in heart failure: a nationwide cohort study. *Circ Heart Fail*. 2023;16(2):e009729. https://doi.org/10.1161/CIRCHEARTFAILURE.122.009729

13. Allen LA, Venechuk G, McIlvennan CK, et al. An electronically delivered patient-activation tool for intensification of medications for chronic heart failure with reduced ejection fraction: the EPIC-HF trial. *Circulation*. 2021;143(5):427-437. https://doi.org/10.1161/CIRCULATIONAHA.120.051863

14. DeVore AD, Majmudar M, Etters L, et al. Digital platform to optimize guideline-directed heart failure therapy: results of the AIM-POWER trial. *Circ Heart Fail*. 2025;19:e013231. https://doi.org/10.1161/CIRCHEARTFAILURE.125.013231

15. Verhestraeten C, Heggermont WA, Maris M. Clinical inertia in the treatment of heart failure: a major issue to tackle. *Heart Fail Rev*. 2021;26(6):1359–1370. https://doi.org/10.1007/s10741-020-09979-z

16. Kim MK, Rouphael C, McMichael J, Welch N, Dasarathy S. Challenges in and opportunities for electronic health record-based data analysis and interpretation. *Gut Liver*. 2024;18(2):201–208. https://doi.org/10.5009/gnl230272

KEY WORDS guideline-directed medical therapy, heart failure, heart failure dashboard, population health

APPENDIX For a supplemental table, please see the online version of this paper.