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AHA SCIENTIFIC STATEMENT

Strategies for Optimizing Heart Failure Care in the Older Adult: A Scientific Statement From the American Heart Association

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ABSTRACT: Heart failure prevalence is increasing and has a disproportionate burden on older adults. Older adults, however, may encounter unique challenges in accessing and navigating comprehensive disease-modifying, guideline-directed therapies, thus limiting use among those at highest risk of cardiovascular death or worsening heart failure. Care of the older adult with heart failure requires tailored treatment plans to overcome barriers to effective therapies in this population. This scientific statement reviews the literature on care optimization for older adults (≥65 years of age) living with heart failure and highlights strategies for clinicians who aim to deliver patient-centered, evidenced-based heart failure care in the context of common comorbidities seen in older adults. We discuss the consistent treatment effect and safety profiles of guideline-directed therapies for heart failure in older adults and how to manage multimorbidity, polypharmacy, frailty, and social needs using a shared decision-making framework. In consideration of the complexity of heart failure care of the older adult, we highlight a structured framework for therapeutic considerations in the context of benefit-to-risk ratio, multimorbidity, and social needs. We offer practical guidance on the care of older adults with advanced comorbidities who may not have been adequately represented in landmark trials. We also consider implementation strategies, health services interventions, and supportive tools that may foster optimal care in older adults with heart failure. This work is aimed at informing the practice of clinicians and health systems alike to improve outcomes and to reduce the morbidity of heart failure in older adults.

Key Words: AHA Scientific Statements ■ health services ■ heart failure ■ multimorbidity ■ patient-centered care

Heart failure (HF) currently affects 55.4 million adults globally and 6.7 million US adults, with the greatest prevalence among older adults.[1,2] Lifetime risk for HF has increased to 24%, affecting 1 in 4 US adults.[1] HF incidence is highest in those >65 years of age, and its prevalence is expected to affect nearly 9% of older adults 65 to 70 years of age.[1] Approximately 80% of HF-related hospitalizations occur in adults >65 years of age, and older adults are at highest risk of short-term rehospitalization and adverse HF outcomes, highlighting the need for tailored best practices and care harmonization.[3] Despite benefits offered by evidence-based HF therapies across LV systolic function, HF mortality rates appear to have increased over the past decade.[1]

Older adults with HF are vulnerable to HF-related morbidity and unique challenges such as frailty, underuse of guideline-directed therapies, and social isolation relative to younger adults.[1,4–8] Effective HF care requires access to medications, care coordination with HF-focused visits and comorbidity management, and the ability to navigate complex health needs across fragmented systems of care. Previous scientific statements have addressed HF-related conditions, including cardiogenic shock, acute coronary syndrome, congenital heart disease, and general cardiovascular care, in the older adult, in addition to unique considerations for equitable telehealth services for older adults with HF.[9–13] The aim of this scientific statement is to contextualize the

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evidence-base for guideline-directed therapies in older adults and to identify patient-, clinician-, and system-level strategies to improve care. Although we focus on medications, we also discuss considerations around the use of cardiac implantable electronic devices (CIEDs) in older adults. We provide guidance on the implementation of evidence in older adults' comprehensive care delivery, focusing on approaches that are patient-centered, social needs guided, and equity based.

CONTEMPORARY MEDICAL AND INTRACARDIAC DEVICE THERAPIES IN OLDER ADULTS WITH HF

Evidence to Support Use of Guideline-Directed Medical Therapy in Older Adults

Standard of care for all patients with HF with reduced ejection fraction (HFrEF) includes 4 components of pharmacological guideline-directed medical therapy (GDMT), consisting of an angiotensin receptor-neprilysin inhibitor (ARNI) or angiotensin-converting enzyme (ACE) inhibitor/angiotensin receptor blocker (ARB) if use of ARNI is not possible, evidence-based β-blocker (eBB; metoprolol succinate, carvedilol, or bisoprolol), mineralocorticoid receptor antagonist (MRA), and sodium glucose cotransporter-2 (SGLT2) inhibitor.[14] For HF with mildly reduced ejection fraction and HF with preserved ejection fraction (HFpEF), current guidelines and recent trial evidence support the use of SGLT2 inhibitor (Class IIa), nonsteroidal (finerenone) or steroidal (eplerenone, spironolactone) MRAs (Class IIb), and diuretics for decongestion (Class I) and provide circumstances to consider an ARNI, ACE inhibitor, or ARB (Class IIb).[14–16] Furthermore, in patients with HF and left ventricular ejection fraction >45% with obesity, evidence from recent clinical trials supports the use of incretin analogs to improve clinical and patient-reported outcomes in HF.[17,18]

It is well recognized that older adults with advanced age, multimorbidity, and frailty and those dwelling in long-term care settings have been underrepresented or excluded from landmark HF clinical trials.[19] Thus, evidence for the efficacy of GDMT in adults >65 years of age is, in part, derived from subgroup or meta-analyses of pivotal HF clinical trials that contributed to regulatory approval or guideline incorporation of each medication; notably, these analyses have demonstrated consistent treatment effect across age subgroups.[20] The PARADIGM-HF trial (Prospective Comparison of ARNI [Angiotensin Receptor-Neprilysin Inhibitor] With ACEI [Angiotensin-Converting Enzyme Inhibitor] to Determine Impact on Global Mortality and Morbidity in Heart Failure) compared the ARNI compound sacubitril/valsartan with the ACE inhibitor enalapril on the composite of cardiovascular death or first hospitalization for HF in patients with HFrEF and included individuals 18 to 96 years of age.[21] A secondary analysis examined clinical and safety outcomes across 4 age categories: (1) <55 years, (2) 55–64 years, (3) 65–74 years, and (4) ≥75 years.[21] The primary end-point event rate (cardiovascular death or HF hospitalization) was highest in the oldest age category, and the benefit of sacubitril/valsartan relative to enalapril was consistent across age categories and when age was examined as a continuous variable.[21] Symptomatic hypotension and renal impairment were more common in older age groups in both the sacubitril/valsartan and enalapril groups.[21]

Analyses from DAPA-HF (Dapagliflozin and Prevention of Adverse-Outcomes in Heart Failure; HFrEF) and DELIVER (Dapagliflozin Evaluation to Improve the Lives of Patients With Preserved Ejection Fraction Heart Failure; HF with mildly reduced ejection fraction/HFpEF) examined the effect of dapagliflozin across age categories of adults >55 years of age.[22,23] The primary end-point event rate (cardiovascular death or worsening HF) was highest among those >75 years of age, and the benefit of dapagliflozin relative to placebo was consistent both across age categories and when age was examined as a continuous variable.[22,23] In patients with HFrEF, volume depletion adverse events were more commonly reported among individuals ≥75 years of age compared with younger age groups in both the dapagliflozin and placebo groups.[22]

A meta-analysis of individual patient data assessed the treatment effect of MRAs across age (<75 or ≥75 years of age) groups in HF using data from RALES (Randomized Aldactone Evaluation Study; HFrEF), EMPHASIS-HF (Eplerenone in Mild Patients Hospitalization and Survival Study in Heart Failure; HFrEF), and TOPCAT Americas (Treatment of Preserved Cardiac Function Heart Failure With an Aldosterone Antagonist; HFpEF).[24] The primary outcome, composite cardiovascular death or HF hospitalization, was consistently reduced by MRA relative to placebo in both age categories.[24] Older patients (≥75 years of age) had more frequent episodes of worsening renal function, defined as estimated glomerular filtration rate drop of >30%; although rates of worsening kidney function were more common in older than younger adults on MRAs, rates of hyperkalemia were similar across age groups.[24]

In a meta-analysis that included 13 833 patients from 11 randomized, placebo-controlled trials in patients with HFrEF, eBBs reduced all-cause mortality across all age categories, modeled by quartiles and continuously, although the percentage of patients >70 years of age was small.[25] In a cross-trial analysis that included EMPHASIS, PARADIGM-HF, and DAPA-HF, comprehensive quadruple-therapy GDMT led to 2.7 additional years of freedom from cardiovascular death or first HF hospitalization compared with conventional GDMT with a β-blocker (BB) and an ACE inhibitor/ARB.[26]

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Transthyretin amyloid cardiomyopathy (ATTR-CM) is a specific cause of HF in older adults that requires special therapeutic considerations.[14] However, conventional HF GDMT in patients with ATTR-CM is controversial. There are few randomized data to guide therapeutic decision-making in this largely older population of patients in whom autonomic dysfunction and conduction disease can limit tolerance of neurohormonal antagonism and β-blockade.[27] Retrospective data are mixed on the benefit of renin-angiotensin-aldosterone system inhibitors (RAASi) and eBB, but the tolerability and clinical benefit of SGLT2 inhibitors appear favorable in several nonrandomized longitudinal registry studies of patients with ATTR-CM.[28,29] Despite historical descriptions of "HFpEF," ATTR-CM can present with HFrEF and HF with mildly reduced ejection fraction, making medical management of ATTR-CM complex and appropriate for referral to a specialist.[27,30] ATTR-CM disease-specific treatment discussion is beyond the scope of this review but should be managed with coexisting cardiac diagnoses in these patients, including atrial fibrillation, ischemic disease, and other cardiometabolic conditions.

Underutilization of GDMT in Older Adults

Data from registries consistently show a lower use of GDMT and less dose optimization with increasing age. In the US-based CHAMP-HF registry (Change the Management of Patients With Heart Failure) and the Optum Clinformatics database, older age was associated with reduced use of eBBs, MRAs, ARNIs, or RAASis, and older individuals were less likely to be on optimal GDMT doses; these disparities are even greater in women than men living with HF.[7,31,32] Similar findings were noted in the CHECK-HF registry (Chronisch Hartfalen ESC-richtlijn Cardiologische praktijk Kwaliteitsproject HartFalen) in Europe, in which there was an inverse association between age and use of ACE inhibitors, eBBs, and MRAs despite adjustment for comorbidities.[33] In the SWEDEHF registry (Swedish Heart Failure), in which more than one-third of individuals were >80 years of age, the use of RAASis, including sacubitril/valsartan, eBBs, and MRAs, decreased progressively with age such that among those <70 years of age, the use of a RAASi/ARNI, eBB, and MRA was 95%, 95%, and 54%, respectively, compared with 80%, 88%, and 35%, respectively, for individuals ≥80 years of age.[34] In addition, only 18% of octogenarians with HFrEF were on a combination of 3 HF guideline-directed medications.[34]

Given the age-related changes in pharmacokinetics (drug metabolism, excretion, distribution) and pharmacodynamics (altered receptor biology), older adults are particularly susceptible to common side effects of GDMT, including hypotension, electrolyte abnormalities, and changes in kidney function.[35] Although α-1 agonists are sometimes used in clinical practice to facilitate tolerability of GDMT in those prone to hypotension, there are few randomized data to guide their use, and uptake is not suggested on a routine basis. Kidney disease is common in older adults with HF, and is associated with underutilization of RAASi and MRA.[35a] Age and the higher rate of side effects can affect the ability to start and titrate GDMT after a HF diagnosis. Careful attention to an older patient's blood pressure, heart rate, and comorbidities is warranted, with efforts to optimize GDMT given its consistent treatment benefit across age subgroups in pivotal HF trials. Gaps in clinical trial evidence should be acknowledged in patients with advanced comorbidities, including severe frailty, dementia, and extracardiac organ dysfunction, all of which are associated with poor survival. Consideration could be given to an individualized treatment plan that incorporates high-quality evidence and patient-specific factors such as the presence of advanced comorbidities, estimated survival, and goals of care.

Use of CIEDs in Older Adults

Implantable cardioverter defibrillators (ICDs) are a mainstay of device therapy to prevent sudden cardiac death in HFrEF. Landmark trials in the 1990s and 2000s noted improved survival with ICDs compared with standard medical therapy in those with HF and severely reduced left ventricular ejection fraction.[36–39] In the United States, 200 000 ICDs are implanted annually, with the majority (74%) implanted for primary prevention.[40,41] The average age of an ICD recipient is 66 years,[40] with >40% of ICDs and cardiac resynchronization therapy (CRT) devices implanted in people >70 years of age.[42] As the general population ages, more older adults are being considered for ICDs. However, older adults are often not adequately represented in randomized clinical trials, especially those requiring invasive procedures.[36–38,43–48] There is mixed evidence on the benefit of ICDs in patients >70 years of age, particularly in nonischemic cardiomyopathy.[49] ICD benefit is noted in trials of ischemic cardiomyopathy, but these trials were conducted before contemporary GDMT when risk of sudden cardiac death was higher; nevertheless, the residual risk of sudden cardiac death in HFrEF remains substantial.[49–54] Registry and prospective cohort data are inconclusive on the risk-to-benefit ratio for ICDs in older adults with complex comorbidities.[34,55–66] Clinical trials are currently ongoing to evaluate ICD utility in the post–myocardial infarction population in the current era of GDMT.[67] Evidence to guide the use of primary prevention ICDs with contemporary GDMT in adults of advanced age and with multimorbidity remains insufficient.

Currently, both the sudden cardiac death and HF guidelines recommend that for older patients who meet the indication for primary prevention ICD, an ICD is reasonable if meaningful survival >1 year is expected (Class

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IIa, Level of Evidence B, nonrandomized).[14,39] Evidence for secondary prevention ICD suggests a mortality benefit after implantation, with consistent treatment effect in subgroup analyses based on age[68–70]; however, a meta-analysis of 3 landmark trials did not show a benefit in patients ≥75 years of age.[71]

CRT is indicated in patients with HFrEF and QRS prolongation on a surface ECG. CRT has been shown in clinical trials to improve quality of life and exercise tolerance, to decrease hospitalizations, and to increase survival.[14,71–75] Prespecified subgroup analyses in each trial noted consistent benefit across age subgroups, although patients with advanced comorbidities were not adequately represented in the trials. Notably, registry data related to CRT suggest consistent survival benefit across age groups.[76,77] In contrast to an ICD alone, CRT with or without a defibrillator can improve quality of life days to weeks after implantation and therefore can be considered in selected older patients who remain symptomatic despite optimization of GDMT. Therefore, in the most recent American Heart Association/American College of Cardiology/Heart Failure Society of America HF guidelines, no age statement is made for CRT in older adults.[14] Instead, emphasis is placed on symptomatic HFrEF, regardless of age, with the presence or absence of normal sinus rhythm and left bundle-branch block with wide QRS duration on maximally tolerated GDMT.

Take-home message: HF pharmacotherapies are underused in older adults. HF GDMT and CIEDs have shown treatment benefit in older adults in subgroup analyses of pivotal clinical trials. There are, however, evidence gaps in the efficacy of drug and device therapies in patients with advanced comorbidities, including severe frailty, and limited life expectancy. In the absence of contraindications, older adults should be offered therapies with careful attention paid to the evidence informing their use, guideline recommendations, advanced comorbidities, and goals of care.

USE OF THE DOMAIN MANAGEMENT APPROACH TO OPTIMIZE EVIDENCE-BASED CARE IN OLDER ADULTS WITH HF

The management of HF in older adults presents unique challenges because of the interplay of multiple factors, including multimorbidity, polypharmacy, cognitive decline, frailty, falls, and social context (Table 1). Effective strategies for optimal care in this population must adopt a holistic approach that integrates these key factors to ensure that treatment plans are personalized and effective in the setting of the multifaceted and complex needs of older adults with HF.[78] To this end,

Table 1. Approach to Addressing the Multidimensional Domains of Health in the Older Adult With HF

Domain	Strategies	Possible outcomes
Medical	Address malnutrition and nutrient deficiencies Reconcile medications to avoid harmful interactions Assess for adverse drug events Deprescribe unnecessary or harmful medications Adopt multidisciplinary teams and interspecialist communication for integrated care Explicitly discuss potential side effects with patients	Improved nutritional status, reduced adverse drug events, improved treatment adherence, better health status
Mind and emotion	Screen for cognitive impairment and depression Simplify medication regimens Use pill organizers or blister packs Engage the patient's social support system to assist with medication administration	Improved cognition, reduced medication errors, enhanced functional independence
Physical	Assess frailty and risk of falls Have mobility and home environment assessed by occupational therapist Initiate and uptitrate GDMT as tolerated Monitor response carefully, with attention to orthostasis and weight loss Optimize nutrition, mobility, strength training	Reduced hospitalizations, enhanced physical function
Social	Engage family and caregivers Engage peer support groups Aim to reduce social isolation Harness telemedicine for virtual visits Address social determinants of health	Reduced hospitalizations, improved emotional well-being and quality of life

GDMT indicates guideline-directed medical therapy; and HF, heart failure.
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the Domain Management Approach conceptualized a 4-domain biopsychosocial framework with the intent of improving health outcomes for the older adult living with HF (Figure 1). This model challenges clinicians to embrace a comprehensive and multidimensional assessment across medical, mind and emotion, physical function, and social environment domains to address the unique needs and multimorbidity of older adults with HF.[78]

Medical Domain

Nutritional Status

Micronutrient deficiencies are common in older adults with HF, resulting from poor nutrition or loss of minerals and water-soluble vitamins with diuretic therapy; most deficiencies can be mitigated with a well-balanced diet and treated with supplementation.[79] Malnutrition is common among older adults with HF, and strategies to address malnutrition have been tested in heterogeneous populations with varying effects.[79] In PICNIC (Nutritional Intervention Program in Hospitalized Patients With Heart Failure Who Are Undernourished), a randomized controlled trial (RCT) of 120 hospitalized patients with HF and malnutrition (defined by the Mini Nutritional Assessment), an individualized nutritional intervention consisting of diet optimization and, if necessary, nutritional supplements for 6 months in addition to routine HF care reduced all-cause death or readmission for HF at 12 months relative to routine HF care alone.[80] Patients enrolled in the PICNIC RCT were on average 79.2 years of age.[80] In secondary analysis of the EFFORT trial (Effect of Early Nutritional Support on Frailty, Functional Outcomes and Recovery of Malnourished Medical Inpatients), in 645 adults with chronic HF hospitalized with acute decompensation who were on average 78.8 years of age, individualized, protocol-driven nutritional support to targeted energy, protein, and micronutrient goals was associated with reduced mortality and major adverse cardiovascular events compared with standard hospital food.[81] Other trials have tested interventions in medical patients, including older adults with HF, with mixed results.[79,82] Current guidelines make no specific recommendations about treating malnutrition in older adults with HF.

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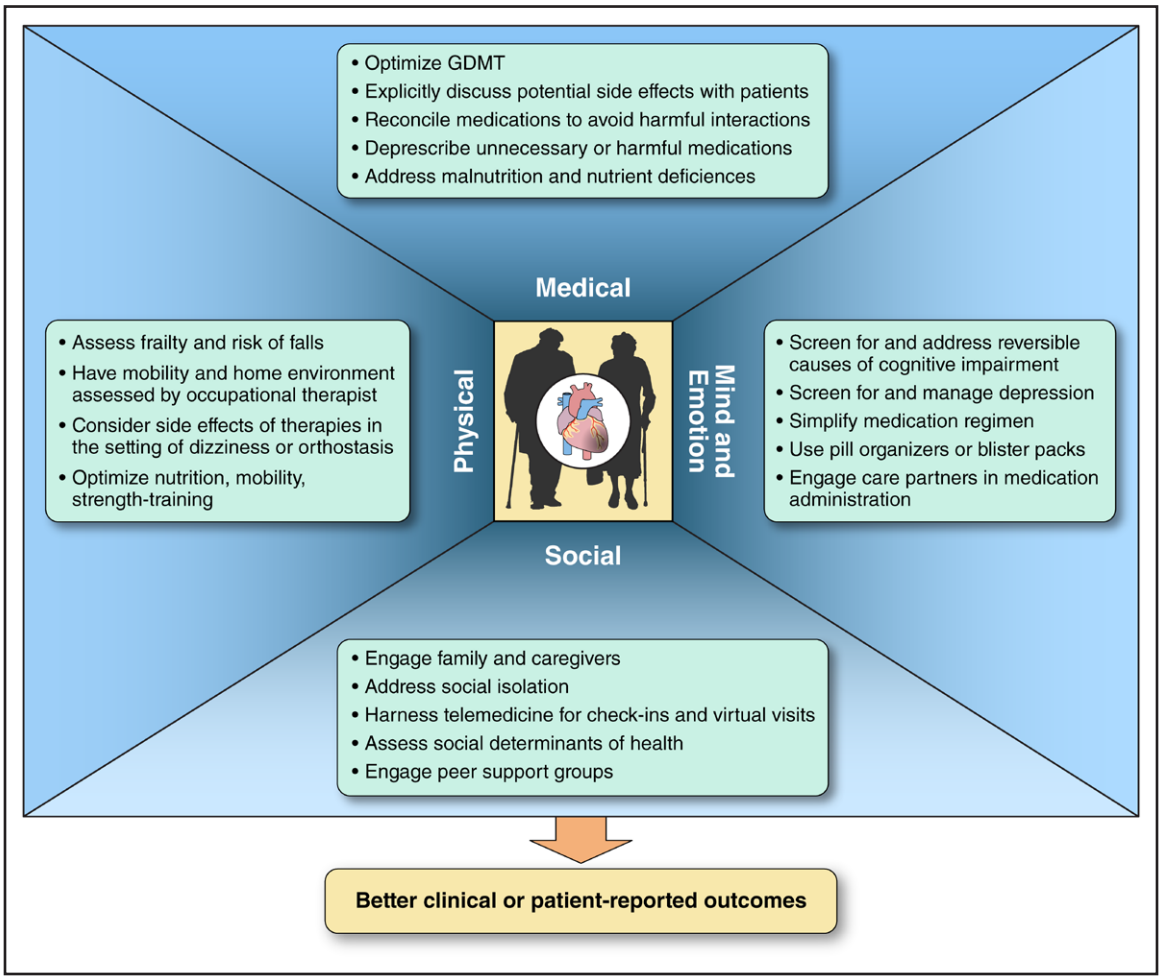

Figure 1. Domain-based strategies to optimize care in the older adult with heart failure.
GDMT indicates guideline-directed medical therapy.

Iron Deficiency

Iron deficiency commonly occurs in older adults and can present with or without anemia.[83,84] Older adults with HF are especially vulnerable to iron deficiency and any associated anemia from multifactorial causes that may include diet and nutrient deficiencies, impaired or inadequate gut absorption, medication interactions, and occult blood loss.[84,85] Iron deficiency has been associated with worse exercise tolerance and HF outcomes.[85] Early small and moderate-sized intravenous iron supplementation RCTs in HFrEF with iron deficiency demonstrated improvement in symptoms, exercise tolerance, and quality of life, whereas larger, more recent RCTs have demonstrated mixed results concerning reduction in HF hospitalizations and cardiovascular death.[14,85–88] An RCT of intravenous iron supplementation in patients with HFpEF with iron deficiency demonstrated improved 6-minute walk distance; however, larger, adequately powered trials are still needed to determine the impact on quality of life and major adverse cardiovascular events in HFpEF.[89] Current AHA/ACC guidelines provide a Class IIa recommendation for intravenous iron supplementation in patients with HFrEF and iron deficiency (with or without anemia) to improve quality of life and functional status.[14] Oral iron supplementation has not demonstrated benefit in patients with HFrEF and iron deficiency anemia, and is considered inadequate repletion in these patients.[14] Intravenous iron supplementation may be considered in a holistic care plan for older adults with HFrEF, factoring in individualized patient goals for additional visits, venous access, proximity and transportation to an infusion center, and considerations of access, coverage, and affordability.[14,90]

Multimorbidity and Polypharmacy

Multimorbidity, defined as the coexistence of ≥2 chronic conditions, is nearly universal in older adults with HF.[78] Multimorbidity influences prognosis, complicates treatment decisions, and often necessitates a nuanced approach to care. The presence of multiple conditions such as diabetes, autonomic dysfunction, chronic kidney disease, and hypertension can significantly alter the risk-to-benefit profile of HF therapies and lead to therapeutic competition whereby a medication that treats one condition can exacerbate another condition. For example, although diuretics are essential in managing congestion, they can exacerbate orthostasis among older adults, necessitating careful monitoring and dose adjustments.

Polypharmacy, defined as the use of ≥5 medications, is closely related to multimorbidity, both cardiac and noncardiac. Polypharmacy is common in older adults with HF and is associated with an increased risk of adverse drug events, medication self-administration errors, and medication nonadherence.[91,92] Drug-drug interactions are common in older adults and, along with medication nonadherence, are causes of avoidable hospital admissions. Polypharmacy can also increase treatment burden, defined as the workload of managing one's medical conditions, and reduce quality of life.

There are several important strategies to manage medications in the setting of multimorbidity and polypharmacy. First, a comprehensive medication review is required to ensure that each agent carries a reasonable benefit-to-risk ratio and aligns with the patient's priorities. When clinicians are reviewing medications and weighing the potential benefits and risks, it is important to consider the impact of coexisting medical conditions on prognosis; for a given medication to be beneficial, the patient should have an anticipated life expectancy sufficient for the patient to potentially derive benefit. Clinicians may consider the Medication Appropriateness Index and the 2023 American Geriatrics Society Beers Criteria to guide prescription and deprescription of medications in older adults.[93–95] It may be reasonable to prioritize therapies that offer benefits across multiple conditions that a patient faces. SGLT2 inhibitors, for example, improve outcomes in HF, diabetes, and kidney disease, making them particularly valuable for patients with multimorbidity, with therapeutic benefit within days to weeks of use.[96,97] When therapeutic competition is present, it is important to consider whether the benefits of treating one condition outweigh the risks of exacerbating another, incorporating the patient's priorities.

Deprescription is the systematic process of discontinuing drugs when existing/potential harms outweigh existing/potential benefits in the context of an individual's care goals, level of functioning, life expectancy, values, and preferences.[98] Drugs that have a low benefit-to-risk ratio and do not improve how patients feel, function, or survive should be deprescribed to simplify treatment regimens. Some potential targets for deprescribing could include expired indications such as dual antiplatelet therapy beyond the evidence-based time frame, primary prevention aspirin in the setting of high bleeding risk, amiodarone for permanent atrial fibrillation, BBs for HFpEF without an alternative indication, or nitrates for angina after revascularization. HF-exacerbating medications, drugs informed by poor evidence, and, in some situations, sedatives, laxatives, analgesics, and proton pump inhibitors, commonly prescribed in hospitals and sometimes continued at discharge without a clear indication, could also be assessed for deprescription.[95,99,100]

More than one-quarter of patients with HF who experience side effects from their medications may not report them to their clinicians.[101] This issue is exacerbated by challenges in attributing side effects to individual medications in the setting of multimorbidity and polypharmacy, further creating uncertainty for patients in identifying which clinician to alert about adverse drug reactions.[102] Clinicians must consider the possibility of side effects,

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engage in open communication, and foster trust so that patients provide relevant information to guide prescribing and deprescribing. A multidisciplinary team with effective communication between subspecialists involved in a patient's care can help improve the patient's experience and integrate historically siloed organ-based care delivery.[103] Several strategies can maximize tolerability and manage side effects.[104]

Pill burden and polypharmacy sometimes limit adherence to therapies, especially in the setting of cognitive dysfunction. Clinicians must address reasons for suboptimal adherence. Medication adherence scales or questionnaires may highlight reasons for limited adherence, which may span factors related to the health care system, patient, or medication itself (Figure 2).[105] A meta-analysis of heterogeneous RCTs in adults ≥65 years of age taking ≥4 medications demonstrated that behavior- or mixed education-behavior–based interventions may improve adherence.[106] Another meta-analysis of 40 RCTs of pharmacist-led interventions in adults 65 to 85 years of age showed improvements in medication adherence but was limited by significant heterogeneity.[107] Interventions to support adherence in older adults include simplification of medication regimens, caregiver involvement, increased education and activation, blister-packed doses, pill organizers, pill reminders, and pharmacist-led interventions. Engaging care partners and informal or formal caregivers to assist with medication preparation and administration can also foster concordance between prescribed therapies and use.

Mind and Emotion

Cognition

Cognitive impairment refers to impairments in the mental process of acquiring knowledge and understanding it. Cognitive impairment is highly prevalent in older adults with HF, affecting up to 78% of this population; it is more common in women than men with HF because of the cumulative risk factor burden and older age at time of HF incidence in women.[108] The AHA 2021 scientific statement on brain health outlines definitions and criteria for cognitive decline, mild cognitive impairment, and dementia.[109] The US Preventive Services Task Force and the American Academy of Neurology do not recommend screening for cognitive impairment in asymptomatic individuals.[109,110] However, in the presence of symptoms of cognitive impairment, validated cognitive assessments such as the Mini-Mental State Examination, Montreal Cognitive Assessment, Addenbrooke Cognitive Examination–Revised, and Mini-Cog test should be used. Each tool varies in sensitivity and specificity for detecting cognitive impairment and dementia, respectively, and tool selection may be influenced by clinical setting, time constraints, and severity of symptoms.[111,112]

Multiple mechanisms contribute to cognitive impairment, including vascular aging, hemodynamic changes with advancing HF, cerebral hypoperfusion, and even polypharmacy.[113] It is important to note that cognitive impairment can affect multiple domains of thinking, including learning and memory, executive function, attention, perceptual motor function, language, and social cognition. These deficits have major implications on medication management, including challenges with reading and comprehension of prescription labels, filling weekly pill boxes, and following complex dosing instructions or schedules (eg, cutting pills in half, taking with a meal, taking extra diuretic conditional to weight gain, ≥3-times-daily medication administration, and dosing schedules or peak medication effects that affect sleep). These challenges can lead to medication nonadherence and medication errors, poor sleep quality, and increased risk for adverse outcomes, including mortality, hospitalization, and loss of functional independence.

The negative impact of cognitive impairment underscores the importance of screening for and incorporating cognitive impairment into decision-making and medication management. When cognitive impairment is present, aggressive use of GDMT may be appropriate given that treatment of HF may improve some components of cognition. Of note, despite the theoretical concern that sacubitril can contribute to dementia, recent data suggest that this is not the case.[114] Blood pressure control (eg, through GDMT uptitration) may also be beneficial for cognition given data showing the negative effects of chronic hypertension on cognition. Both high and low diastolic blood pressures have been implicated in cognitive decline.[115] Although it is important to avoid hypoperfusion of the brain, the threshold of diastolic blood pressure below which cognition may decline is unclear and likely differs for individuals. Symptoms such as lightheadedness and new fatigue, decreasing diuretic efficiency, and worsening kidney function may be signs of hypoperfusion. Inotropes in the setting of low cardiac output could be helpful for symptom relief, but they have no established clinical benefit and should be used as part of a palliative approach unless the patient is being considered for advanced HF therapies.[116]

A holistic review of the medication regimen beyond cardiovascular medications may be important because agents that can negatively affect cognition are common. Although medications such as anticholinergic and sedating agents are not in the traditional purview of HF clinicians, it may be prudent to partner with pharmacists as part of the multidisciplinary team to assess the risk and benefit of these medications and to consider deprescribing.[117] When cognitive impairment is present, it is also important to consider strategies to handle medication regimen complexity because more complex regimens can increase risk for medication errors and related adverse drug events.

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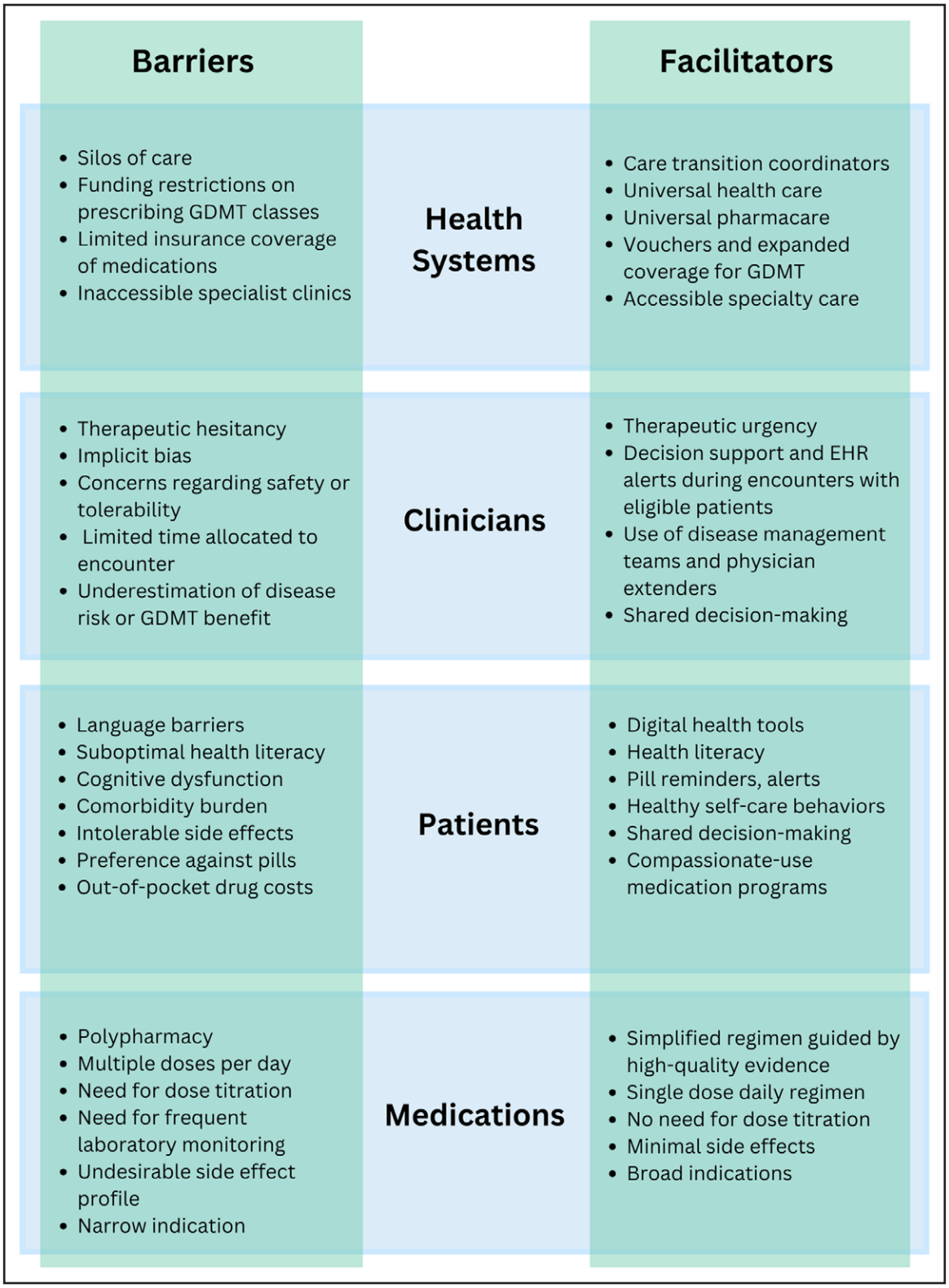

Figure 2. Barriers and facilitators to the uptake of GDMT in older adults with heart failure.
Target the health care system (policy), institutions or clinicians, and patients. GDMT indicates guideline-directed medical therapy.

Depression

Depression is common in older adults with HF, with some studies suggesting that up to 47% of older adults with HF have comorbid depression on clinical screening.[118–121] The pathophysiological mechanisms underlying HF and depressive symptoms are poorly understood. Hypoxia of

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the hippocampus, the emotional center of the brain, secondary to low cardiac output and compromised cerebral blood flow may contribute to depressive symptoms in HF, although situational depression and social isolation may also play a role.[14,122–124] Moderate to severe depression has been associated with higher all-cause and HF-related hospitalization, all-cause and cardiovascular mortality, and functional decline in patients with HF.[14,125–129] Older adults with HF and depression also have higher health care use and associated costs than those without depression.[119]

Current HF guidelines recommend screening for depression as a potential barrier to effective HF self-care and implementing depression interventions, including medical treatment, psychotherapy, or nurse support.[14] Older adults with HF and comorbid depression may be undertreated with antidepressants and psychotherapy, further complicating HF self-care, GDMT adherence, and patient activation in HF disease management.[118] Particular attention should be given by clinicians to older adults with HF who identify as socially isolated and are at high risk of comorbid depressive symptoms.

Physical Function

Frailty and Sarcopenia

About 45% of all adults with HF are considered frail,[130] which is a phenotype characterized as physiological decline across multiple systems, resulting in unintentional weight loss, weakness, slowness, physical exhaustion, and low physical activity.[131] There is strong evidence that frailty in HF is associated with worse clinical[132–134] and patient-oriented outcomes.[135,136] Given the prevalence and prognostic significance of frailty, multiple guidelines recommend that adults with HF, especially older adults and those with advanced HF, should be assessed for frailty.[137–139] There are >60 available frailty assessments, including the Frailty Phenotype Criteria[131] (or versions thereof) and the Frailty Index,[140] which have been used extensively in HF.

Recent studies have shown that patients with frailty with HF may be less likely to be treated with GDMT than patients without frailty.[141–143] The reasons for this are unclear but may be related to clinical inertia, reduced perceived benefit, and the association of frailty with adverse drug events. However, evidence is starting to emerge that patients with frailty do in fact benefit from GDMT.[141,144] Given the overlapping and bidirectional relationship between HF and frailty, treating patients with optimal GDMT may ameliorate frailty. For example, reducing congestion and optimizing HF care may improve physical function and facilitate increased participation in physical activity, which can itself combat frailty. Moreover, preclinical mechanistic evidence supports the capacity of ACE inhibitors/ARBs to improve muscle function and frailty in HF.[145] Taken together, the presence of frailty itself should not necessarily interfere with GDMT initiation and titration, although additional data are needed to better understand whether patients with severe frailty derive benefit from GDMT.

Sarcopenia, which is the age-related progressive loss of muscle mass and strength, is another factor to consider in medically managing older patients with HF.[146] Advanced age coupled with pathophysiological processes of HF can accelerate the presentation of sarcopenia and functional decline. HFpEF may also specifically be associated with altered skeletal muscle metabolism in older adults.[147] It is important to ensure that medical strategies to treat HF and related comorbidities do not inadvertently compound the development and progression of sarcopenia. For example, although glucagon-like peptide-1 receptor agonists and SGLT2 inhibitors in some instances promote weight loss, which can positively address an important pathophysiological driver of HFpEF, the loss of fat mass may be accompanied by a loss of muscle mass, thereby increasing the risk of exacerbating sarcopenia.[148] These effects on body composition underscore the importance of understanding the potential effects of HF-specific medications on age-related conditions such as sarcopenia and incorporating such data into future guidelines to adequately and comprehensively inform clinicians and patients about the pros and cons of HF-specific medications within the context of aging. Future investigation is needed to fully delineate the impact of pharmacotherapies that may affect muscle mass or sarcopenia progression in older adults. Mitigation strategies, including protein supplementation, resistance training, and formal cardiac rehabilitation, which is underused in older adults with HF, may help to mitigate muscle wasting and worsening frailty in older adults.[149,150]

Falls

Older adults are at risk of falls, and this risk is particularly high in HF.[137] A retrospective cohort study showed that older adults with HF have greater odds of falling than those without HF.[151] A prospective study that tracked falls over 1 year showed that 40% of adults with HF reported at least 1 fall, and 25% reported ≥2 falls.[152] Falls can lead to serious morbidity and mortality, and their occurrence and prevention should be deliberately discussed in clinical encounters.[153] The causes of falls in HF are likely multifactorial, related to cardiac causes (eg, syncope, orthostatic hypotension), noncardiac causes (eg, sarcopenia, cognitive dysfunction, arthritis, visual impairment, decline in mobility/functional status), and medication side effects.[154] Indeed, a fall in a patient with HF may result from multiple factors such as reduced cardiac output, a concomitant arrhythmia, frailty, deconditioning, environmental hazards in the home, or any combination thereof. Given the multifactorial nature of falls, a comprehensive geriatric assessment that includes medical, physical, and psychosocial domains can help to mitigate fall risk.[155]

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HF clinicians must be aware of and proactive concerning the prognostic implications of falls in older adults.[153] Clinicians can adopt strategies to mitigate the risk of falls while concurrently maximizing HF GDMT in older adults. First, it is important to ask about any recent falls and, if a fall has occurred, to identify and address possible fall contributors. Including care partners and other family members in this conversation may be helpful for determining contributing factors. Asking about activities of daily life (ie, ability to ascend/descend stairs, independence with chores) can capture functional impairment that patients are hesitant to voice or have normalized in their daily life over time. Second, all medications should be reviewed carefully. As a first-line strategy, modifying medication regimens to eliminate or replace agents that are known to increase fall risk, including antidepressants, opioids, and sedatives, may be prudent. For example, for the older adult with HF and diabetes, replacing sulfonylureas with SGLT2 inhibitors can reduce the risk of hypoglycemia (a risk factor for falls) while optimizing GDMT. Volume depletion from overdiuresis could result in orthostasis and increase the risk of falls, so decongestion regimens should be carefully monitored, especially when quad-based regimens may be initiated and further titrated, limiting the need for high-dose concomitant diuretic regimens. GDMT agents that can decrease blood pressure (such as ACE inhibitors/ARBs/ARNIs) ought to be carefully titrated, with split or staggered doses to minimize hypotension or orthostasis. In addition, non–guideline-based antihypertensives such as calcium channel blockers and thiazide diuretics should be considered for deprescription to allow better use of evidenced-based GDMT. A full list of medication classes to consider in older adults with or at risk of falls is given in an AHA scientific statement dedicated to falls in patients with CVD.[154]

Social Environment

Social Context

The social domain is an essential yet often underappreciated component of HF management in older adults. This domain warrants particular attention because of the high prevalence of social isolation and loneliness among older adults, both of which have been shown to significantly exacerbate HF symptoms and contribute to adverse outcomes.[156,157] Social isolation is independently associated with a 50% increased risk of mortality among older adults with HF.[158,159] Lack of social support is associated with poorer adherence to HF treatment regimens, leading to increased hospitalization rates and a higher burden of morbidity.[160] Robust social support networks, on the other hand, have been associated with better clinical outcomes in HF, including improved survival, reduced hospitalizations, enhanced adherence to GDMT, and opportunities to be cared for in less common models of home-based care such as hospital at home.[161,162] The mechanisms by which social support exerts its beneficial effects may include increased patient engagement, enabling digital engagement/literacy, better management of comorbidities, and improved emotional well-being, as well as buffering the stress associated with chronic illness.

To optimize social support, clinicians should prioritize the engagement of family members and caregivers in the HF management process when possible. This includes involving family members, friends, and formal or informal caregivers when providing education about HF self-care and counseling related to GDMT and medication adherence. In addition, evidence supports the use of structured social engagement programs such as peer support groups, community activities, and telehealth interventions as a means to augment HF care.[163] In particular, telemedicine has demonstrated effectiveness in engaging patients, enhancing self-management, and providing regular virtual check-ins for patients with limited mobility or those residing in remote areas.[164] It can be a helpful tool for improving outcomes among older adults with HF, increasing quality of care, and decreasing costs.[13] However, telehealth services that were incentivized during the COVID-19 pandemic have an uncertain future in the United States, with payers and clinicians awaiting policy decisions. Furthermore, the divide in digital access and digital literacy across age, geographic, and social demographic groups may limit the use of telehealth services in the most vulnerable patients with HF, although these patients are also underserved by more traditional models of care.[13]

The 2022 American Heart Association/American College of Cardiology/Heart Failure Society of America guidelines provide a Class I recommendation to assess social needs for patients living with HF.[14] A comprehensive assessment of social determinants of health, including socioeconomic status, living conditions, and access to care, should be fully incorporated into the assessment of patients with HF to identify those at high risk of poor outcomes and to guide interventions to optimize HF treatment strategies. This comprehensive assessment not only may be achieved through a structured domain-based assessment that includes evaluation of the social environment but is bolstered by a multidisciplinary approach that includes geriatricians, pharmacists, social workers, and HF specialists.[78,117] A social worker can address the need for home health services or transportation assistance. Programs that offset copayments and prescription of generic drugs can help patients navigate the financial barriers that affect treatment adherence. Social determinants of health and caregiver involvement influence the health trajectory of patients with HF, and a multidisciplinary approach that addresses all 4 domains in older adults with HF can enhance care satisfaction and outcomes. A multidisciplinary approach may be particularly effective in the care of

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female patients with HF, who on average are 5 years older at diagnosis, face a higher burden of cognitive impairment and frailty, and need supportive care more often than their male counterparts with HF.[165]

Take-home message: Frameworks such as the Domain Management Framework provide a structured approach to optimizing HF care in older adults, addressing the complex interplay of medical, cognitive, physical, and social factors. By tailoring interventions to the specific needs of this population, clinicians can enhance patient outcomes, improve quality of life, and reduce the burden of HF. This comprehensive approach underscores the importance of multidisciplinary team involvement and cross-specialty communication, as well as the active involvement of patients and their caregivers, in the management of HF.

SHARED DECISION-MAKING AND ADVANCE CARE PLANNING FOR THE OLDER ADULT WITH HF

Shared decision-making (SDM) and advance care planning (ACP) are distinct and related concepts central to the management of older adults with HF, for whom the burden of multimorbidity, frailty, and competing health priorities complicates care decisions. Discussions on these topics should prioritize patient autonomy and the evolving nature of goals over time in which functionality and quality of life may take precedence over survival metrics alone.[166] The role of the HF clinician is integral in supporting these discussions, providing nuanced evidence-driven and value-focused counseling. Sharing comprehensive information on the patient's journey and anticipated decision points can allow patient-driven individualization of HF management and goals of care.

Defining Patient Goals

Although both SDM and ACP are grounded in the ethic of supporting autonomy, this does not mean that decisions should be left solely to the patient. Rather, establishing trust is essential to eliciting what matters most to patients.[167] This aligns with the geriatric 5Ms framework (mind, mobility, medications, multi-complexity, and what matters most), which centers on individual values.[168] Social determinants such as health literacy, transportation access, and financial toxicity directly influence a patient's ability to engage in decision-making and to adhere to therapies. Understanding these contextual factors is crucial to appropriately guiding patients to their individualized optimal choice. Social workers embedded in HF teams can help to contextualize the psychosocial risks that would make advanced HF therapies such as left ventricular assist device (LVAD) or heart transplantation higher risk for individual patients. Social workers, pharmacists, and palliative care practitioners can partner with clinicians to identify barriers and solutions to holistic HF care, including in the evaluation of advanced therapies.

Although advanced therapies are not the primary focus of this review, the DECIDE-LVAD trial (Trial of a Decision Support Intervention for Patients and Caregivers Offered Destination Therapy Heart Assist Device), a randomized trial of shared decision support across 6 centers including 248 patients being considered for destination LVAD therapy, illustrates how SDM can systematically be incorporated into HF care. The study found modest improvement in patient knowledge and concordance between patient-reported values and treatment choice but not with the actual received treatment. Notably, the cohort receiving the shared decision support intervention had substantially lower rates of LVAD implantation, with variance across centers.[169] Although the majority of patients who were initially in favor of LVAD therapy retained this value over time, a sizeable cohort changed their feelings toward LVAD by 6 months.[170] Recognition of the complexities and dynamic nature of patient decision-making throughout the HF journey makes serial re-evaluation of patient goals a key feature of best practice in SDM.

Assessing the Benefit Versus Burden of Therapies

SDM helps patients and clinicians weigh trade-offs, burdens, and the differential impact of HF therapies and align these considerations with patients' health outcome goals. Tools such as the Medication Appropriateness Index and the STOPP/START (Screening Tool of Older Persons' Prescriptions/Screening Tool to Alert to Right Treatment) criteria can be helpful for prescribing/deprescribing decisions in older adults.[171] Decisions about CIED therapies must also consider patient priorities and potential impact on their disease course, incorporating the potential effect of device therapy on quality of life, device-related complications, and life expectancy. Some patients prioritize longevity; others would prefer the option to die quickly without a CIED, even if it means they will not live as long. Both choices can be reasonable and rational for any given patient.[170] Often, it is not a simplistic trade-off between quantity and quality of life in terms of pursuing invasive procedures and interventions, and patient-centered discussions should include the possible inconvenience, discomfort, complications, and in-hospital days that may accompany these interventions. The key for the practitioner is to ensure that this discussion takes place, enabling the patient's clinical situation, potential impact on disease course, and their individual goals to inform the shared decisions.

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Advance Care Planning

As the population of people with advanced HF grows, center-defined age cutoffs for advanced therapies are evolving, with some high-volume centers forgoing strict age-based exclusion for case-by-case evaluation of frailty, multimorbidity, and SDM.[172] Additional data are needed to better understand the interplay of biologic and chronologic age to reliably quantify surgical risk, resiliency, and likelihood of recovery. Studies are also needed to better identify older adults with modifiable frailty and impaired mobility.[173]

ACP requires nuanced discussions about invasive HF therapies. In fact, since 2013, the Centers for Medicare & Medicaid Services has mandated palliative care consultation before implantation of destination therapy LVAD.[174] For patients with refractory symptoms who remain limited despite optimal therapy or who cannot tolerate GDMT, palliative care can be helpful. Of note, there is a common misconception conflating palliative care with hospice care that can lead to patients prematurely rejecting palliative care services, an avoidable scenario with appropriate education. Home or ambulatory inotropes can provide symptom relief but have no proven mortality benefit while increasing risk of arrythmia and requiring long-term intravenous access.[172,175]

Ultimately, SDM and ACP are ongoing relational processes that honor patient autonomy, reduce unwanted interventions, and support a dignified trajectory through chronic illness. Early referral to HF specialists can allow timely evaluation for advanced therapies and better alignment of HF care options with patient goals. Most important, SDM must be an iterative process. Goals and preferences shift over time, especially as HF progresses. Regular reassessment ensures that treatments remain aligned with the patients' evolving values and health outcome goals.

Take-home message: Values and preferences are important in grounding decisions on medical treatment and invasive care, particularly in the setting of advanced frailty, in which knowledge gaps remain in the effect of some treatments. Tools such as the Medication Appropriateness Index and the STOPP/START criteria can be helpful for prioritizing medications in older adults with HF. ACP requires nuanced, patient-centered discussions with clearly defined patient goals. Early referral to advanced therapies and to palliative care may be helpful in managing refractory HF symptoms.

ADDRESSING MULTILEVEL FACTORS TO OPTIMIZE GDMT FOR OLDER ADULTS

The 4 classes of GDMT result in large mortality reductions in HFrEF, with consistent treatment effects in older adults, as noted previously.[19–21,77] However, implementing this evidence remains a challenge, and eligible patients, particularly older adults and women,[7] are undertreated. The underuse of HF therapies may result from multilevel barriers that could be addressed with targeted implementation strategies (Figure 2).[136,137] A summary of evidence-based implementation strategies that optimize HF GDMT uptake by addressing multilevel barriers is presented in Table 2.

Health System Interventions

Pharmacare

Affordability of HF GDMT may differentially affect older adults, who often rely on a fixed income. Annual out-of-pocket cost for a standard HFrEF quadruple-therapy regimen, including metoprolol succinate, sacubitril/valsartan, eplerenone, and dapagliflozin, was estimated at $2849 for patients enrolled in Medicare without supplemental prescription drug plans in 2021.[183] Although low-cost generic drugs are widely available for BBs, ACE inhibitors/ARBs, and MRAs, most of the costs are attributable to sacubitril/valsartan and SGLT2 inhibitors. Although the 2022 AHA/ACC/Heart Failure Society of America HF guidelines demonstrate that most Class I recommended HF GDMT is indeed cost-effective in quality-adjusted life years gained, patient-facing costs may still be high.[14]

Reducing prescription costs or copays may increase GDMT adherence, at least after myocardial infarction.[176] In the MI FREEE RCT (Post-Myocardial Infarction Free Rx Event and Economic Evaluation), patients randomized to full versus usual prescription coverage for ACE inhibitors/ARBs, BBs, and statins after myocardial infarction had greater odds of prescription adherence to these classes, although the primary composite clinical outcome, first readmission for a major vascular event or coronary revascularization, did not decrease with the intervention.[183] The typical patient in this trial was a middle-aged adult, although affordability also can be a barrier for older adults.

Additional solutions may assist with lowering prescription drug costs for older US adults who are Medicare beneficiaries. First, Medicare has a low-income subsidy program (the Extra Help program) available to reduce out-of-pocket costs.[184] Any beneficiary with Part D benefits can apply or in some cases are automatically enrolled, although it is highly restricted on the basis of income. Second, empagliflozin, dapagliflozin, and sacubitril/valsartan were among the first 10 drugs selected for the Medicare Drug Price Negotiation Program, which should lower the out-of-pocket costs for these medications for Medicare beneficiaries.[185] Medicare has also set a cap of $2000 on annual out-of-pocket prescription drug costs per person as of 2025.[186] Availability of generic versions of dapagliflozin and sacubitril/valsartan

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 Circulation. 2026;153:e00–e00. DOI: 10.1161/CIR.0000000000001437

Table 2. Evidence-Based Implementation Strategies That Improve GDMT Uptake

Trial	Trial design population	Intervention comparator	Primary outcomes and outcome related to GDMT
Pharmacare			
MI FREEE[176]	Design: Cluster RCT Sample: 5855 patients after MI (mean age, 54.0 y; 25.0% female)	Intervention: Full prescription coverage of insurance plan sponsors for any statins, BBs, ACE inhibitors, or ARBs Comparator: Usual coverage with out-of-pocket costs established by insurance plan	Primary: Composite outcome of first readmission for a major vascular event or coronary revascularization (HR, 0.93 [95% CI, 0.82–1.04]) Other: Full medication adherence to ACE inhibitor, BB, and statin increased with the intervention (OR, 1.41 [95% CI, 1.18–1.67])
Electronic GDMT alerts for clinicians			
BETTER CARE-HF[177]	Design: Parallel 3-group cluster RCT Sample: 180 cardiologists, 2211 patients (mean age, 73 y, 28.6% female)	Interventions: (1) EHR-based GDMT alerting system to cardiologists during encounters with patients with HFrEF vs (2) electronic messages to cardiologists between encounters Comparator: No alerts	Primary: New MRA prescription (relative risk, 2.53 [95% CI, 1.77–3.62] in alert group; relative risk, 1.67 [95% CI, 1.21–2.29] in electronic message group)
GDMT titration algorithms			
STRONG-HF[178]	Design: Parallel design RCT sample: 87 hospitals in 14 countries; 1078 patients (mean age, 63.0 y, 39.0% female)	Intervention: GDMT initiation in hospital and postdischarge optimization of therapies, with aim of 100% of the target GDMT doses <2 wk after discharge. Comparator: Usual care as per local physician follow-up	Primary: Composite of all-cause death or HF readmission at 6 mo (risk ratio, 0.66 [95% CI, 0.50–0.86]) Other: Proportion on full target-dose GDMT higher in each of the 3 GDMT classes titrated in the trial
Patient activation			
EPIC-HF[179]	Design: Parallel individual RCT Sample: 306 patients (mean age, 65.0 y, 29.0% female)	Intervention: Patient activation with a 3-min education video and 1-page checklist delivered by email before cardiology clinic appointments Comparator: Usual care; no implementation intervention	Primary: GDMT intensification (RR, 1.6 [95% CI, 1.2–2.2])
Digital GDMT optimization			
ADMINISTER[180]	Design: Parallel RCT Sample: 150 patients (mean age, 69.2 y, 26.0% female)	Intervention: Multifaceted digital consults with remote monitoring of pharmacotherapy and vital signs, and patient online learning Comparator: Usual care; no implementation intervention	Primary: GDMT prescription rate score (median, 1.19 [IQR, 0.25–2.3] units vs 0.08 [IQR, 0.00–1.00] units; $P<0.001$)
Self-care interventions			
SMART-HF[181]	Design: multicenter RCT Sample: 124 patients (mean age, 67.5 y, 35.1% female)	Intervention: Home-based tool OPTILOGG with symptom monitoring, interactive education, and adjustment of loop diuretics in the patient´s home Comparator: Usual care; no implementation intervention	Primary: Self-care behavior, including medication adherence (median, 21.5 [IQR, 13.25–28] vs 26 [IQR,18–29.75]; $P=0.014$)
Smartphone app–based model of care (TCC)[182]	Design: Parallel 2-group multicenter RCT Population: 164 patients (mean age, 61.5 y, 20.7% female)	Intervention: TCC app with connected devices (digital sphygmomanometer, digital weighing scale, fitness band), remote monitoring, educational messages Comparator: Usual care; no implementation intervention	Primary: Rehospitalization (21 in TCC vs 41 usual care; $P=0.02$) Other: Medication adherence score (participants who reported medication adherence, 57/76 [75%] vs 37/74 [50%]; $P=0.002$)

ACE indicates angiotensin-converting enzyme; ADMINISTER, Assessment of Digital Consults on Clinical Impact and Efficacy Using an RCT; app, application; ARB, angiotensin receptor blocker; BB, β-blocker; BETTER CARE-HF, Building Electronic Tools to Enhance and Reinforce Cardiovascular Recommendations for Heart Failure; EHR, electronic health record; EPIC-HF, Electronically Delivered, Patient-Activation Tool for Intensification of Medications for Chronic HFrEF; GDMT, guideline-directed medical therapy; HF, heart failure; HFrEF, heart failure with reduced ejection fraction; HR, hazard ratio; IQR, interquartile range; MI, myocardial infarction; MI FREEE, Post-Myocardial Infarction Free Rx Event and Economic Evaluation; MRA, mineralocorticoid receptor antagonist; RCT, randomized controlled trial; SMART-HF, Self-Care Management Intervention in Heart Failure; STRONG-HF, Safety, Tolerability and Efficacy of Rapid Optimization, Helped by NT-proBNP and GDF-15, of HF Therapies; and TCC, TeleClinical Care.

could further improve the affordability of HF GDMT. Access and affordability remain barriers for the uptake of glucagon-like peptide-1 receptor agonists and nonsteroidal MRAs. Last, patient assistance programs offered by pharmaceutical companies may enable patients to receive their medication(s) at lower cost. Clinics that can administratively streamline prior authorization and patient assistance program application may improve patient medication access, adherence, out-of-pocket expenses, and clinician comfort.

Audit and Feedback

The Get With The Guidelines–HF cluster randomized trial in the United States demonstrated that audit and feedback of site-based quality metrics, including prescription of ACE inhibitor/ARB and BB prescriptions at discharge,

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did not improve the primary outcome of quality-of-care score compared with no feedback at 1 year.[187] There were no between-group differences in other quality measures, including GDMT prescriptions. However, an implementation initiation, IMPLEMENT-HF, demonstrated a marked improvement in quadruple GDMT among eligible patients discharged from HF hospitalization among participating sites, suggesting that cross-site collaboratives that share formulary changes, electronic health record (EHR) tools, and site-level feedback can improve GDMT implementation.[188]

Multidisciplinary Health Care Services

Several models of care have been tested in HF. A network meta-analysis of 54 RCTs demonstrated the benefit of nurse-led case management, nurse-led home visits, and disease management clinics in reducing all-cause deaths and readmissions after hospitalization for HF; other transitional care interventions, including pharmacy-led and telemonitoring interventions were less effective and did not reduce these outcomes.[189] The trials in the meta-analysis had at least modest risk of bias, however, and were largely single-center or single-region trials.[189]

Transitional Care

Transitional care services integrate care as patients transition between health care settings and clinicians. The PACT-HF pragmatic stepped-wedge cluster RCT (Patient-Centered Care Transitions in Heart Failure) of 10 Canadian hospitals demonstrated that transitional care services—incorporating patient education, nurse-led home visits and telephone calls, and HF clinics in the weeks after discharge—did not improve the composite end point of all-cause emergency visits, hospitalizations, or death at 3 months after hospitalization for HF.[103] Outcomes did not improve at 3 years after discharge, and there was no difference in the short- or long-term uptake of ACE inhibitor/ARB, BB, MRA, or diuretic use.[13,14,103,190] Average age at trial enrollment was 78 years. The CONNECT-HF pragmatic RCT (Care Optimization Through Patient and Hospital Engagement Clinical Trial for Heart Failure) of 161 US hospitals randomized to a transitional care quality improvement initiative versus usual care demonstrated no improvement in the coprimary outcomes of composite HF readmission or all-cause death at 3 years or composite HF care quality score after hospitalization for HFrEF.[191] The use of RAASis, BBs, ACEIs/ARBs/ARNIs, and MRAs at >50% of target doses was low and did not improve with the intervention.

Clinician-Level Interventions

EHR Alerts

EHR alerts to clinicians on GDMT eligibility can prompt attentiveness to prescribing. The 3-arm BETTER-CARE-HF trial (Building Electronic Tools to Enhance and Reinforce Cardiovascular Recommendations for Heart Failure) demonstrated that clinicians randomized to receive EHR alerts during outpatient HFrEF encounters increased prescriptions of MRAs, the targeted therapy, relative to those receiving messages between encounters; both these digital options increased prescription relative to usual care.[177] Unfortunately, most EHR-based studies track EHR prescription rather than true adherence, an important caveat particularly in older adults who may face barriers to retrieving and affording medications.

GDMT Titration Algorithms

The STRONG-HF RCT (Safety, Tolerability and Efficacy of Rapid Optimization, Helped by NT-proBNP Testing, of Heart Failure Therapies) demonstrated the efficacy of in-hospital algorithmic initiation and titration coupled with frequent postdischarge uptitration of GDMT, diuretic adjustment, and monitoring of natriuretic peptides to assess congestion in patients hospitalized for HF on suboptimal therapies.[178] The primary end point, a composite of all-cause death or HF readmission at 6 months, was reduced in the treatment group. At 3 months, a greater proportion of patients in the intervention group achieved >50% of the target doses for BBs, ACEIs/ARBs/ARNIs, and MRAs. STRONG-HF enrolled patients with an average age of 63 years. Few patients >75 years of age were enrolled, although a subset analysis suggested no difference in the impact of the intervention in older compared with younger individuals.[192] Notably, STRONG-HF excluded patients with estimated glomerular filtration rate <30 mL·min^{-1}·1.73 m^{-2} and those with systolic blood pressure <100 mm Hg.[178]

Clinicians often fail to elicit how patients feel when starting a new medication or to fully assess medication side effects.[102] Clinicians may also struggle with determining whether the side effect is truly attributed to the medication, particularly given evidence that some drugs may have a "nocebo" effect.[193] Furthermore, interventions to improve clinician assessment of and attribution of medication effects have not been formally tested. Guiding or probing questions about side effects, staged introduction of medications, and dose adjustments to foster tolerability may be reasonable options to enhance adherence and persistence to newly introduced therapies.[102]

Patient-Level Interventions

Addressing Social Needs

Multifaceted and interconnected social needs affect optimal HF care in the older adult. Regular assessment of social needs can be accomplished through standardized assessments, including the Comprehensive Geriatric Assessment (validated scale that assesses psychosocial, medical, functional, and environment needs).[194]

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Consideration of social needs and ethnic and cultural differences is important across all age groups, especially older adults with HF, who may experience barriers or delays to care and possibly adverse outcomes in situations of significant social need, including limited health literacy,[195,196] communication barriers, food insecurity, unfavorable housing conditions,[197] transportation, and depression or other mental health concerns.[198]

Older adults experience the highest rates of social isolation, which can be amplified in severe disease and acute medical events.[195] Sensory and functional limitations can each separately affect HF care. Access to and use of aids for sensory and functional limitations (ie, visual/hearing aids and mobility aids) can widely vary across individuals.[13] Last, older adults have the lowest rates of digital literacy despite continued growing rates of technology use.[13] Barriers to digital literacy include cognitive dysfunction, insufficient dexterity, familiarity with smartphones and other digital devices, and internet access.[199,200]

Existing strategies that consider social needs to optimize GDMT for HF in older adults have had mixed results.[201–204] Such interventions include early initiation of care transition coordinators,[205,206] use of peer patient navigators or community health workers,[207,208] community partnerships, and self-care interventions for individuals or dyads specifically designed for older adults. Findings from the ADMINISTER trial (Management Regarding clinical Impact, Safety and Efficacy Using a Randomized Controlled Trial),[180] an RCT testing multicomponent digital consults, showed significant improvements in GDMT optimization.

Gerontechnology and Patient Activation

Gerontechnology is an interdisciplinary field that harnesses digital health technologies for older adults, addressing specific needs such as health monitoring, medical care, safety, mobility, cognitive support, and social engagement.[209] A strength of gerontechnology for HF care is that barriers are iteratively assessed so that care is optimally matched to individual patient and family[168] and social needs.[210] Gerontechnology interventions with established efficacy to optimize HF care in older adults are still emerging.

Patient activation can be a key intervention for GDMT optimization, including in older adults with HF. The EPIC-HF RCT (Electronically Delivered, Patient-Activation Tool for Intensification of Medications for Chronic Heart Failure With Reduced Ejection Fraction) demonstrated that a 3-minute video and checklist electronically distributed to patients before cardiology appointments increased GDMT intensification over the ensuing month relative to usual care, primarily because of uptitration of BBs.[179] Participants in the EPIC-HF RCT had a median age of 65 years.[179] Patient education on self-care led by nurses was also an effective intervention for improving HF outcomes (rehospitalizations, mortality) in meta-analyses of RCTs with adults ≥55 years of age.[204]

Take-home message: Prescription subsidies, EHR alerts to clinicians, algorithmic uptitration of GDMT during and after hospitalization for HF, and education aimed to activate patients increase GDMT prescription or uptake among patients enrolled in randomized trials. Financial disincentives, audit and feedback, and transitional care services without algorithm-driven treatment do not appear to be effective. Social needs that influence the uptake of HF care, including GDMT, should be regularly assessed. Results of trials testing interventions that consider social needs in the context of HF care are overall mixed. Emerging digital tools should be evaluated in older populations to ensure equity across the spectrum and specific accommodations needed for gerontechnology.

PALLIATIVE CARE

Provision of palliative care along with disease-modifying HF therapies can improve symptoms and health-related quality of life (HRQOL). In times of clinical stability and relatively preserved health status, palliative needs such as basic symptom management and advance care planning can often be met through primary palliative care provided by the patient's primary care and HF clinical teams. For example, in the CASA trial (Collaborative Care to Alleviate Symptoms and Adjust to Illness), in patients with HF (mean age, 65.5 years), a nurse- and social worker–led intervention to provide symptom management and psychosocial support in a primary care setting resulted in improvement in depression and fatigue at 6 months.[211] As older adults progress toward advanced HF, they may benefit from specialty palliative care to address more complex needs such as refractory symptoms and assistance with complex decision-making.

RCT data suggest that older adults with worse baseline HRQOL may derive particular benefit from structured palliative care interventions. In the PAL-HF trial (Palliative Care in Heart Failure), patients with advanced HF (mean age, 71 years) and fair to poor HRQOL (mean Kansas City Cardiomyopathy Questionnaire overall summary score, 33.7) randomized to a multicomponent palliative care intervention provided by palliative care specialty teams had greater improvement in HRQOL, anxiety, depression, and spiritual well-being compared with those given usual care.[212] In contrast, in the ENABLE CHF-PC trial (Effect of an Early Palliative Care Telehealth Intervention vs. Usual Care on Patients With Heart Failure), an intervention delivered by palliative care specialists in patients with better preserved HRQOL (mean Kansas City Cardiomyopathy

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Questionnaire score, 52.6) did not improve HRQOL or depressive symptoms compared with usual care over 16 weeks.[213] The American Heart Association/American College of Cardiology/Heart Failure Society of America HF guidelines provide a Class I recommendation to engage palliative care in patients with refractory HF symptoms. If advanced therapies are not desired or a viable option, palliative care in conjunction with palliative pharmacotherapy may improve both symptoms and quality of life in advanced stage D HF, especially at the end of life.[116]

Take-home message: Palliative care teams can support individuals with complex needs and poor HRQOL, which become more common as HF progresses. Palliative care should be integrated into HF care throughout the disease trajectory.

CONCLUSIONS

Across randomized clinical trials, Class I–recommended GDMT has a consistent treatment effect across age groups, including in older adults. However, the burden of health deficits spanning multiple domains in older adults in clinical settings makes them vulnerable to side effects that are best mitigated by careful deployment of algorithmic titration and close monitoring to ensure tolerability. The Domain Management Framework provides a structured approach to optimizing HF care, addressing the complex interplay of medical, cognitive, physical, and social factors in older adults who are prone to falls, frailty, cognitive decline, and social isolation. Prescription subsidies, EHR alerts to clinicians, algorithmic uptitration of GDMT, and digital health tools to activate patients can increase the implementation of GDMT, which is underused across age groups, especially in older adults. Financial disincentives, audit and feedback, and transitional care services without algorithm-driven treatment do not appear to be effective. Individualized approaches can balance the HRQOL and mortality benefit associated with GDMT with polypharmacy that is uniquely burdensome to older adults. Therapies that do not improve how patients feel or function or are not likely to improve survival based on expected life span can be considered for deprescribing to simplify treatment regimens. There are knowledge gaps in integrating biological with chronological age criteria to better guide recommendations for advanced therapies; these gaps need to be closed to better quantify surgical/procedural risk, resiliency, and likelihood of recovery. SDM can meaningfully engage the older adult with HF, ensure patient-clinician alignment, help clarify goals of care, and maximize quality of life. Early and broad engagement of palliative care could enable more older adults with refractory HF symptoms to receive this multidimensional support mechanism and expertise.

ARTICLE INFORMATION

The American Heart Association makes every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest.

This statement was approved by the American Heart Association Science Advisory and Coordinating Committee on March 4, 2026, and the American Heart Association Executive Committee on May 28, 2026. A copy of the document is available at https://professional.heart.org/statements by using either "Search for Guidelines & Statements" or the "Browse by Topic" area. To purchase additional reprints, call 215-356-2721 or email Meredith.Edelman@wolterskluwer.com

The American Heart Association requests that this document be cited as follows: Lewsey SC, Martyn T, Blumer V, Brownell NK, Denfeld QE, Dunlay SM, Goyal P, Halloway S, Matlock D, Vardeny O, Van Spall HGC; on behalf of the American Heart Association Cardiovascular Disease in Older Populations Committee of the Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing; Council on Basic Cardiovascular Sciences; Council on Lifelong Congenital Heart Disease and Heart Health in the Young; and Heart Failure and Transplantation Committee of the Council on Clinical Cardiology. Strategies for optimizing heart failure care in the older adult: a scientific statement from the American Heart Association. *Circulation*. 2026;153:e•••–e•••. doi: 10.1161/CIR.0000000000001437

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Acknowledgments

The writing group acknowledges the role of Rebecca A.V. Newton (McMaster University) in drafting Figure 2 and Table 2.

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Disclosures

Writing Group Disclosures

Writing group member	Employment	Research grant	Other research support	Speakers' bureau/ honoraria	Expert witness	Ownership interest	Consultant/ advisory board	Other
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*Modest.

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Rajiv Sankaranarayanan	Liverpool University Hospitals NHS Foundation Trust (United Kingdom)	CHART Study (CHART trial: comprehensive assessment for older people with heart failure and frailty; collaborator)*; SARC-HF Study exploring relationship of heart failure, sarcopenia, frailty with metabolomics, nutritional and exercise interventions (collaborator)†	British Heart Foundation Research Grant (PhD on heart failure and arrhythmogenesis)†; AstraZeneca (cardiorenal metabolic grant to support nurse PhD)†; NHS Transformation Agency (grant support to establish acute heart failure virtual ward)†; British Heart Foundation (Innovation Grant to support Everton Beat Breathlessness Community Hub)†	Novartis (honoraria for talks given)*; Vifor (speaker honorarium received)*; Medtronic*; Roche (speaker honorarium received)*; Pharmacosmos*; speaker honoraria and conference attendance support from Astra Zeneca†; conference attendance support from Novartis*; conference attendance support from Roche*; conference attendance support from Pharmacosmos*	None	None	Advisory Board (Bayer) (one-off meeting)*	None
Stephanie Turrise	University of North Carolina-Wilmington	American Heart Association AIREA grant (I am the PI on an AIREA grant that has just ended July 31, 2025, and it was in heart failure)†	None	None	None	None	None	None

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