# Guidelines for the Management of Heart Failure
# Clinical Practice Guideline Endorsement
# MedStar Health

*"These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider-in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations".*

MedStar Ambulatory Best Practice Committee endorses the 2022 and 2021 American College of Cardiology Expert Consensus Decision Pathway for the Optimization of Heart Failure Treatment.[1] With this latest 2022 update, the American College of Cardiology (ACC) and American Heart Association (AHA) hope to provide clinicians with "actionable knowledge" and to this end, this document contains many Expert Consensus Decision Pathways. These pathways are intended to guide clinicians, not define the one correct answer.

This article serves as an update to the 2021 guidelines with pertinent changes to ambulatory care added from the 2022 guidelines. What follows below is a summary and key figures and tables. Practitioners are encouraged to review the primary document for a better understanding of this summary and endorsement. This document will focus on the ambulatory care management for patients with heart failure.

The 2021 Update reviews how to:

- Implement guideline directed medical treatment – how to select, initiate and titrate medications.
- How to address challenges with referrals, care coordination, adherence, specific patient cohorts and medication cost and access.
- How to manage increasing complexity of care, comorbidities and palliative and hospice care.

Pertinent additions from the 2022 guidelines for ambulatory care include:

- Guidelines-Directed Medical Therapy for Heart Failure with reduced ejection fraction now lists 4 medication classes including Sodium-glucose cotransporter-2 inhibitors (SGLT2i).
- SGLT2i have a Class 2a recommendation in HF with mildly reduce ejection fraction. Weaker recommendations (Class of Recommendation 2b) are made for ARNi, ACEi, ARB, MRA and beta blockers in this population.
- New recommendations for HFpEF are made for SGLT2i (Class of Recommendation 2a) MRAs (Class of Recommendation 2b), and ARNi (Class of Recommendation 2b). Several prior recommendations have been renewed including treatment of hypertension (Class 1recommendation), treatment of atrial fibrillation (Class of Recommendation 2a),

use of ARBs (Class of Recommendation 2b), and avoidance of routine use of nitrates or phosphodiesterase-5 inhibitors (Class of Recommendation 3: No Benefit).

- ❖ Patients with advanced HF who wish to prolong survival should be referred to a team specializing in HF. A heart failure specialty team reviews HF management: assesses suitability for advanced HF therapies and uses palliative care including palliative inotropes where consistent with the patient's goals of care.
- ❖ Primary prevention is important for those at risk for HF (stage A) or pre-HF (stage B). Stages of Heart Failure Guideline HF were revised to emphasize the new terminologies of "at risk" for HF for stage A and pre-HF for stage B.
- ❖ Recommendations are provided for select patients with HF and iron deficiency, anemia, hypertension, sleep disorders, type 2 diabetes, atrial fibrillation, coronary artery disease, and malignancy.

The 2022 guidelines update the ACC guidelines to emphasize the development and progression of disease:

**ACC/AHA Stages of Heart Failure**:
**Stage A:** At high risk for HF
**Stage B:** Pre-Heart Failure
**Stage C:** Symptomatic Heart Failure
**Stage D:** Advanced Heart Failure

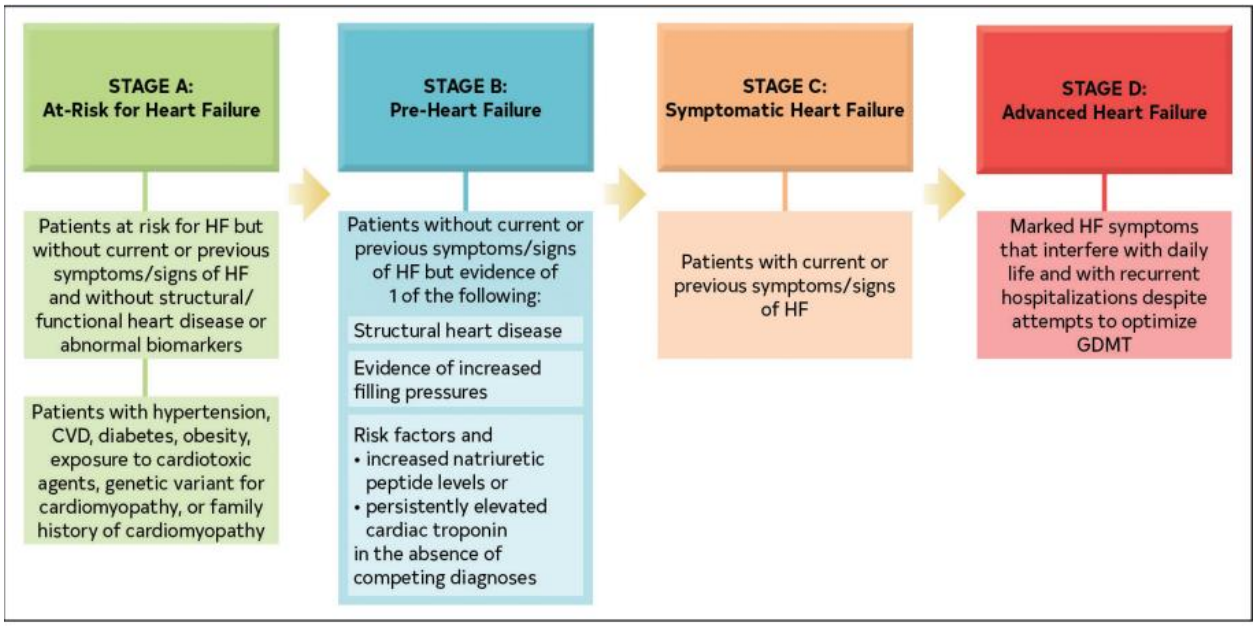



**Figure 1: ACC/AHA Stages of Heart Failure. Therapeutic interventions in each stage aim to modify risk factors (stage A), treat risk and structural heart disease to prevent HF (stage B), and reduce symptoms, morbidity, and mortality (stages C and D).**

The NYHA function classification remains unchanged in the 2022 guidelines and is an independent predictor of mortality. However, there is now an emphasis on the continuum of care of a patient with heart failure. Although a patient with stage C heart failure may be asymptomatic with treatment (NYHA class 1), they are still categorized at stage C heart failure.

**New York Heart Association (NYHA) functional classification:**
**Class I:** No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
**Class II:** Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
**Class III:** Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
**Class IV:** Unable to perform any physical activity without symptoms of HF, or symptoms of HF at rest.

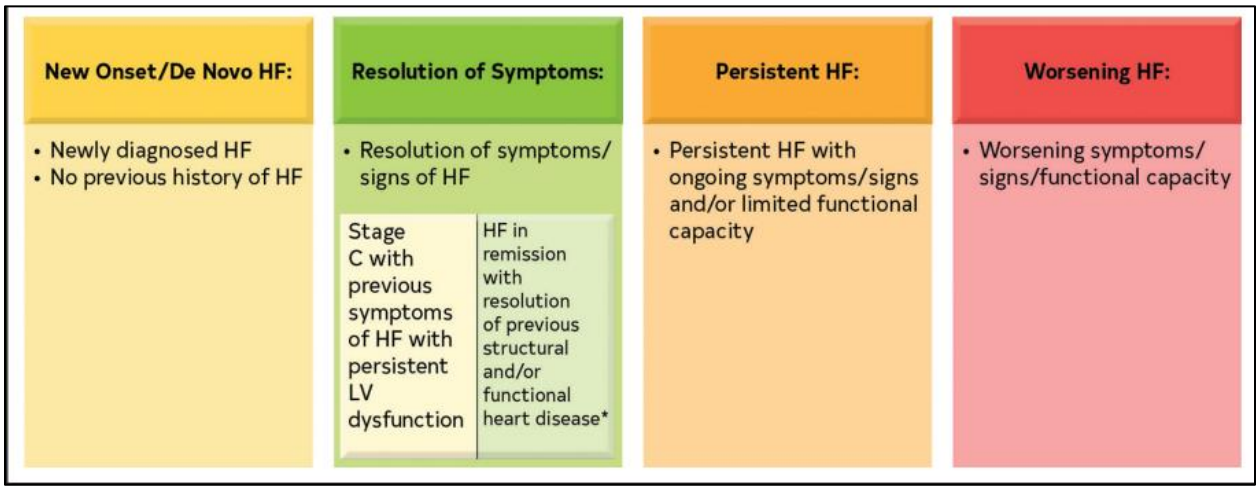



**Figure 2: Continuum of Stage C Heart Failure**

In an accompanying article by the ACC, the following are key perspectives addressed by the 2022 guidelines, verbatim:

1. Heart failure (HF) encompasses a broad range of left ventricular (LV) function. New treatment guidelines address the entire spectrum of HF. The classification of HF is as follows: HFrEF (HF with reduced ejection fraction [EF]): LVEF ≤40%; HFimpEF (HF with improved EF): Previous LVEF ≤40% and follow-up measurement of LVEF >40%; HFmrEF (HF with mildly reduced EF): LVEF 41-49%; HFpEF (HF with preserved EF): LVEF ≥50%. All patients with current or prior HF, irrespective of EF, should be considered for guideline-directed medical therapy (GDMT).

2. GDMT has expanded to include four classes: 1) renin-angiotensin system inhibition (RASi) with angiotensin receptor-neprilysin inhibitors (ARNi), angiotensin-converting enzyme inhibitors (ACEi), or angiotensin (II) receptor blockers (ARB) alone; 2) beta blockers; 3) mineralocorticoid receptor antagonists (MRA); and 4) sodium-glucose cotransporter-2 inhibitors (SGLT2i). ARNi is now recommended as first-line RASi to reduce morbidity and mortality in HFrEF (Class of Recommendation 1a). ACEi is recommended when ARNi is not feasible, and ARB in those who are ACEi intolerant and when ARNi is not feasible. In symptomatic patients with HFrEF who tolerate ACEi or ARB, replacement with ARNi is recommended for further reduction in morbidity and mortality.

3. New recommendations were made for the use of SGLT2i in HF. In symptomatic patients with chronic HFrEF, SGLT2i is recommended to reduce hospitalization and cardiovascular mortality, regardless of the presence of type 2 diabetes (Class of Recommendation 1a). SGLT2i can also be beneficial in patients with HFmrEF and HFpEF (Class of Recommendation 2a).

4. While there is little data to guide management of patients with HFimpEF, a small, randomized trial (TRED-HF) demonstrated a high rate of relapse of dilated cardiomyopathy (44%) within 6 months of discontinuation of GDMT. Therefore, it is recommended that GDMT be continued in patients with HFimpEF, including those who are asymptomatic, to prevent relapse of HF and LV dysfunction.

5. High value therapies (<$60,000/quality-adjusted life year gained) include ARNi, ACEi, ARB, beta blocker, MRA, hydralazine and isosorbide dinitrate in African Americans, implantable cardioverter-defibrillator (ICD), and cardiac resynchronization therapy (CRT), while SGLT2i and cardiac transplantation are of intermediate value. Tafamadis for amyloid was identified as low value (>$180,000/quality-adjusted life year gained), while mechanical circulatory support and pulmonary pressure monitoring are of uncertain value.

6. Patients with suspected amyloid should undergo screening for monoclonal light chains, and if negative, bone scintigraphy should be performed to confirm the presence of transthyretin amyloid. Genetic testing is recommended in patients with transthyretin amyloid to differentiate hereditary variant from wild type. Tafamadis is recommended in select patients with wild-type or variant transthyretin amyloid to reduce cardiovascular morbidity and mortality (Class of Recommendation 1a). Anticoagulation is reasonable in patients with cardiac amyloid and atrial fibrillation to reduce the risk of stroke (Class of Recommendation 2a).

7. Signs and symptoms of HF can be nonspecific. Therefore, supporting evidence of increased filling pressures, either invasive (hemodynamics) or noninvasive (diastolic function on imaging, natriuretic peptide) are required for confirmation of diagnosis when the EF is >40%.

8. Timely referral for HF specialty care is recommended for advanced HF patients (if in accordance with goals of care) to review HF management and to assess suitability for advanced HF therapies.

9. HF is a progressive disease, as highlighted by the ACC/AHA Stages of HF A-D. New terminology incorporates the designations "at-risk" and "pre-HF". Primary prevention of HF, through lifestyle modification, screening, and management of risk factors and comorbid conditions, is recommended for those at risk (Stage A) or pre-HF (Stage B).

10. Management of comorbid conditions in patients with HF may be beneficial. The new guideline provides recommendations for select patients with HF and anemia, iron deficiency, hypertension, sleep disorders, type 2 diabetes, atrial fibrillation, coronary artery disease, and malignancy.

The 2021 document included the following principles, which are either unchanged or not addressed in the 2022 guidelines but remain pertinent to ambulatory primary care. They are reproduced here verbatim:

- Principle 1: Guideline directed medical therapy (GDMT) is the foundation of HF care, and the GDMT with the highest expected benefit should be prioritized.
- Principle 2: Target doses are associated with best outcomes.
- Principle 3: Start GDMT immediately. Delayed initiation of GDMT is associated with never initiating GDMT.
- Principle 4: Attention to the clinical, social, and financial barriers to achieving GDMT should be prioritized.
- Principle 5: Diligent management of volume status will reduce patient symptoms.
- Principle 6: Tolerability and side effects depend, in part, on how and when GDMT is prescribed.
- Principle 7: Primary prevention implantable cardioverter-defibrillator and cardiac resynchronization therapy should be considered after consistent use of optimal doses of all GDMTs for at least 3 to 6 months, followed by reassessment of EF and other indications for device therapy.
- Principle 8: Focus on the patient's symptoms, functional capacity, and cardiac function.
- Principle 9: The value of a therapy to a patient is the combination of benefits and burdens as they relate to that patient's values, goals, and preferences.
- Principle 10: Team-based care is critical to optimizing GDMT and may include frequent follow-up visits, telehealth visits, and remote monitoring.

## The following are the Key Tables and Figures from the 2022 and 2021 ACC Update.

**Adapted from Table 1: Guideline Directed Medication Therapy (2021) with updates from 2023**

| Medication* | Starting Dose | Target Dose | Common Adverse Effects | Additional Clinical Information |
|---|---|---|---|---|
| **Beta Blockers** | | | | |
| Bisoprolol ($68) | 1.25mg once daily | 10mg once daily | Headache<br>Fatigue | May mask symptoms of hypoglycemia in diabetics |
| Carvedilol<br>*Coreg*®<br>($257) | 3.125mg twice daily | Weight <85kg: 25mg twice daily<br><br>Weight 85+kg: 50mg twice daily | Dizziness<br>Fatigue<br>Weight gain<br>Erectile dysfunction | Take with food to decrease risk of orthostatic hypotension<br><br>May mask symptoms of hypoglycemia in diabetics |
| Metoprolol Succinate<br>*Toprol XL*®<br>($92) | 12.5-25mg daily | 200mg daily | Dizziness<br>Fatigue<br>Headache<br>Depression | Tartrate form should not be used in heart failure<br><br>May be split in half but not crushed or chewed<br>Do not discontinue abruptly<br><br>May mask symptoms of hypoglycemia in diabetics |
| **ARNIs** | | | | |
| Sacubitril/valsartan<br>*Entresto*®<br>($401 – brand only) | 24/26mg-49/51mg daily | 97/103mg daily | Hyperkalemia<br>Dizziness | Avoid in pregnant patients |
| **ACEIs** | | | | |
| Captopril ($261) | 6.25mg 3x/day | 50mg 3x/day | Hyperkalemia<br>Angioedema | Take at least 1 hour before meals<br><br>Avoid in pregnant patients |
| Enalapril<br>*Vasotec*®<br>($166) | 2.5mg twice daily | 10-20mg twice daily | Hyperkalemia<br>Dizziness<br>Angioedema | If SCr > 1.6, start at 2.5mg daily<br><br>Avoid in pregnant patients |

| | | | | |
|---|---|---|---|---|
| Lisinopril<br>*Zestril*®<br>($47) | 2.5-5mg daily | 20-40mg daily | Dizziness<br>Headache<br>Hyperkalemia<br>Angioedema | Avoid in pregnant patients |
| Ramipril<br>*Altace*®<br>($67) | 1.25-2.5mg daily | 10mg daily | Dizziness<br>Headache<br>Angioedema | Avoid in pregnant patients |
| **ARBs** | | | | |
| Candesartan<br>*Atacand*®<br>($129) | 4-8mg daily | 32mg daily | Dizziness<br>Headache | Avoid in pregnant patients |
| Losartan<br>*Cozaar*®<br>($167) | 25-50mg daily | 150mg daily | Dizziness | Avoid in pregnant patients |
| Valsartan<br>*Diovan*®<br>($395) | 20-40mg twice daily | 160mg twice daily | Dizziness<br>Headache | Avoid in pregnant patients |
| **Aldosterone Antagonists** | | | | |
| Eplerenone<br>*Inspra*®<br>($130) | 25mg daily | 50mg daily | Hyperkalemia | |
| Spironolactone<br>*Aldactone*®<br>($26) | 12.5-25mg daily | 25-50mg daily | Hyperkalemia<br>Gynecomastia | |
| **SGLT2 Inhibitors** | | | | |
| Dapagliflozin<br>*Farxiga*®<br>($678 – brand only) | 10mg daily | 10mg daily | Urinary tract infection<br>Diabetic ketoacidosis<br>Hypotension | Must maintain adequate hydration |
| Empagliflozin<br>*Jardiance*®<br>($712 – brand only) | 10mg daily | 10mg daily | Urinary tract infection<br>Diabetic ketoacidosis<br>Hypotension | Must maintain adequate hydration |
| **Vasodilators** | | | | |
| Hydralazine<br>($96) | 25mg 3x/day | 75mg 3x/day | Diarrhea<br>Loss of appetite | |
| Isosorbide dinitrate<br>*Isordil Titradose* ®<br>($214) | 20mg 3x/day | 40mg 3x/day | Headache<br>Lightheadedness | PDE 5 inhibitors contraindicated in patients on nitrates |
| Isosorbide dinitrate/hydralazine | 1-tab 3x/day | 2-tab 3x/day | See individual agents | |

| | | | | |
|---|---|---|---|---|
| combination (20/37.5mg) *BiDil*® ($754) | | | | |
| **Other** | | | | |
| Ivabradine *Corlanor*® ($681 – brand only) | 2.5-5mg twice daily | Titrated to goal heart rate 50-60bpm<br>Max dose 7.5mg twice daily | Atrial fibrillation<br>Phosphenes | Take with food<br>Available as oral solution if patient unable to swallow tabs |

*AWP for 30 days of medication at maximum target dose unless specified otherwise

**Figure 5: Diagnostic Algorithm for HF and EF-Based Classification.**

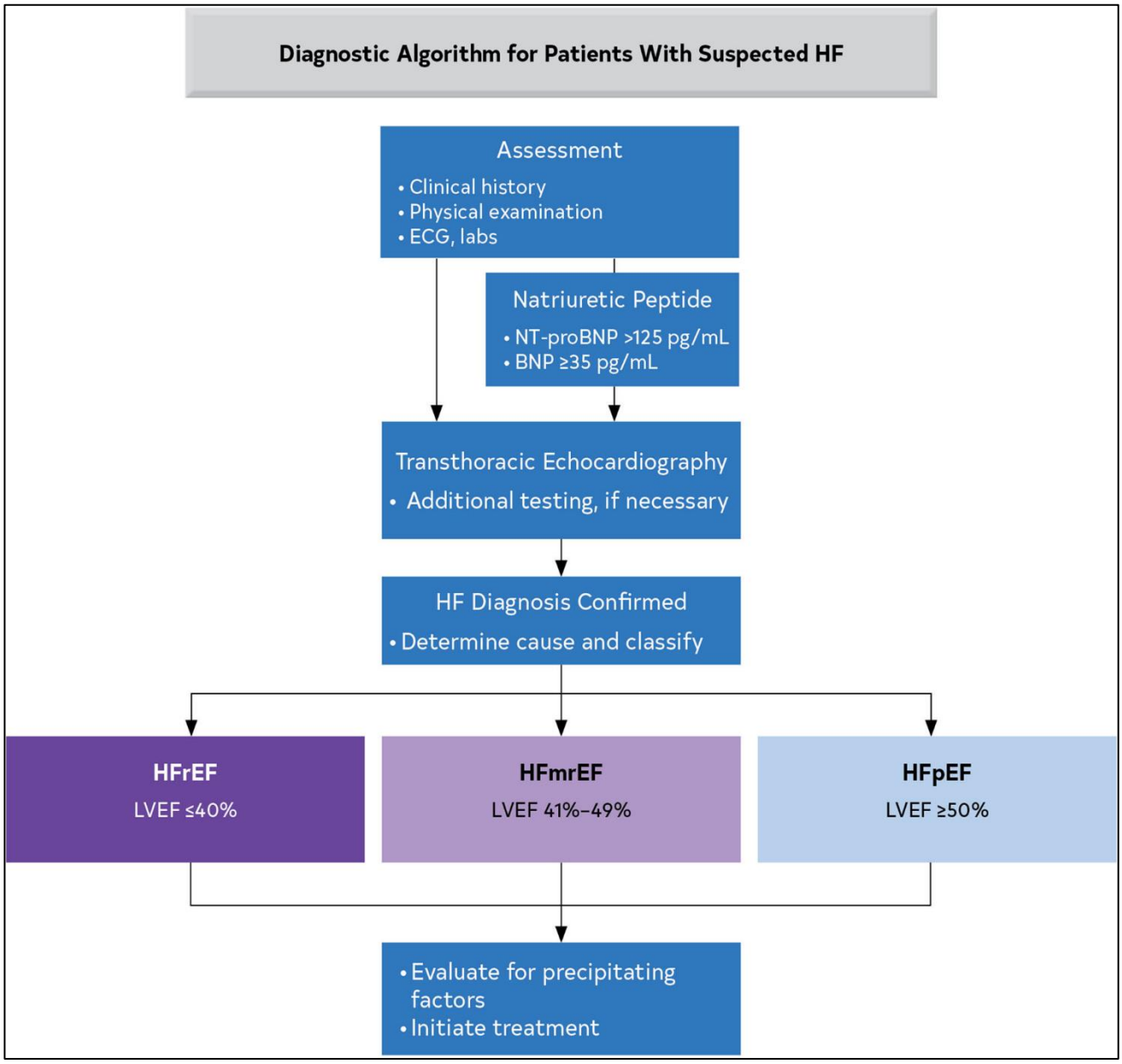


**Figure 3 below outlines the recommendations (Class 1 and 2a) for medication management for At-risk HF (stage A) and pre-HF (stage B). (2022)**

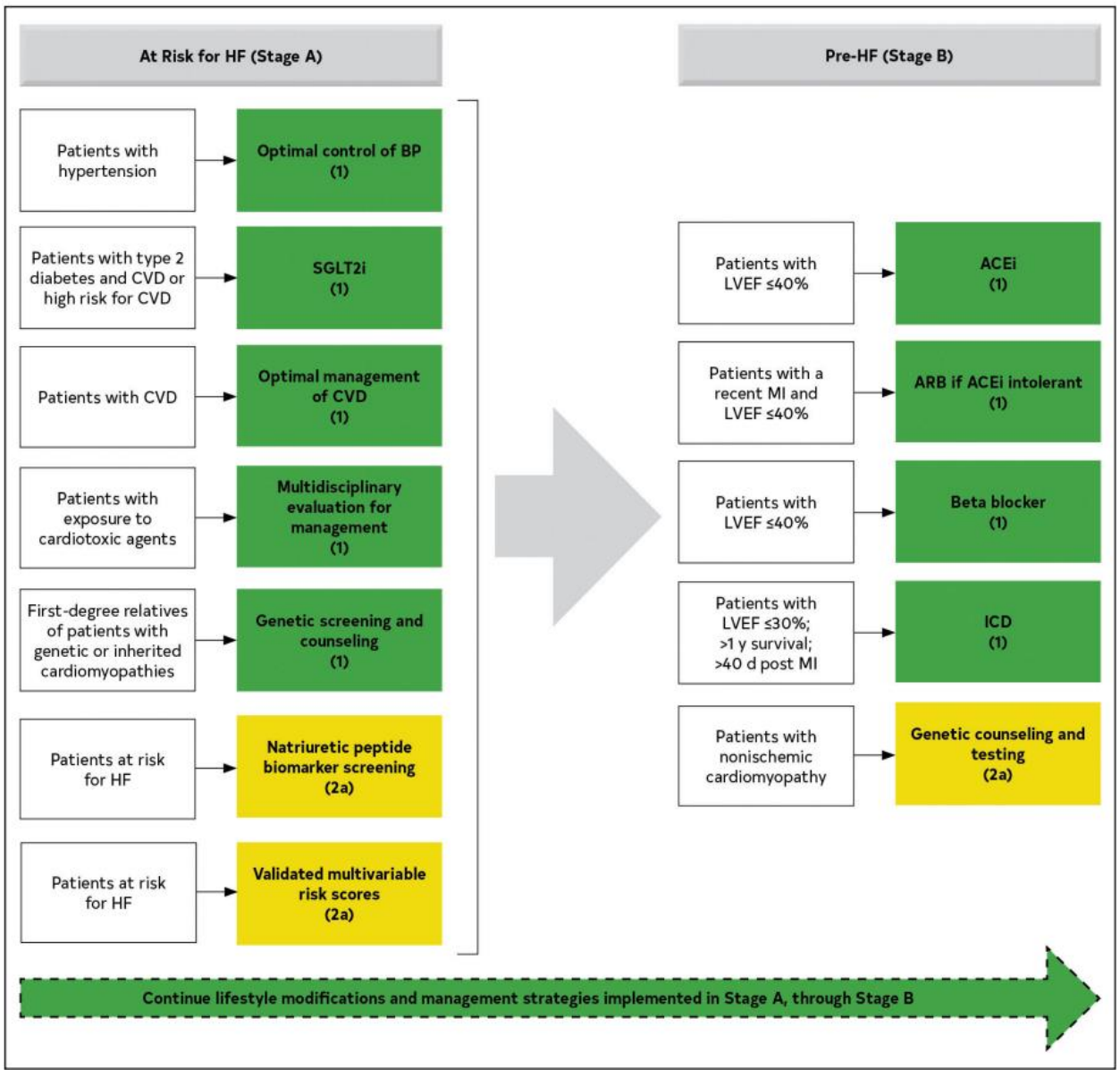


**Figure 4: Classification and Trajectories of HF Based on LVEF. Patients with HFrEF who improve their LVEF to >40% are considered to have HFimpEF and should continue HFrEF treatment**

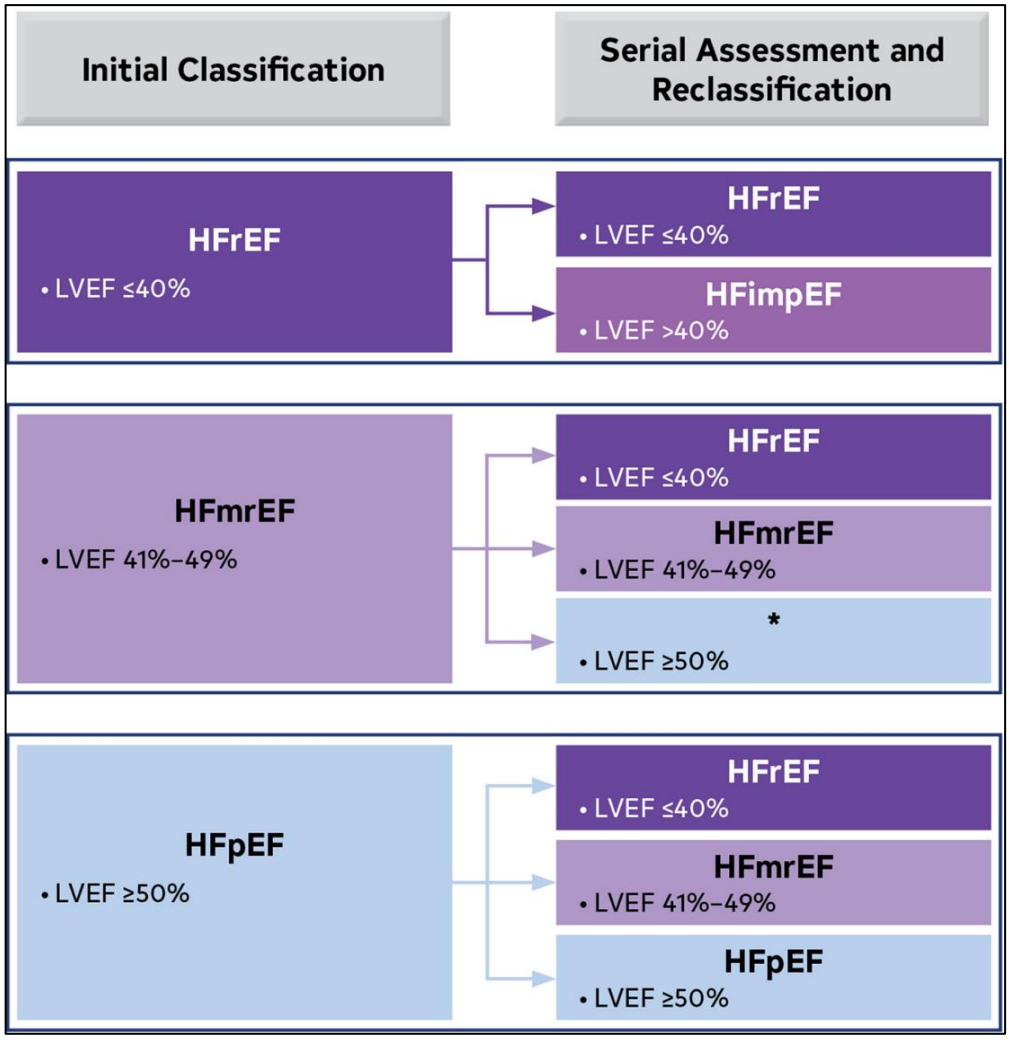


**Figure 6: Offers guidance on treatment strategies for patient with Heart Failure with Mildly Reduced EF (41-49%) (2022).**

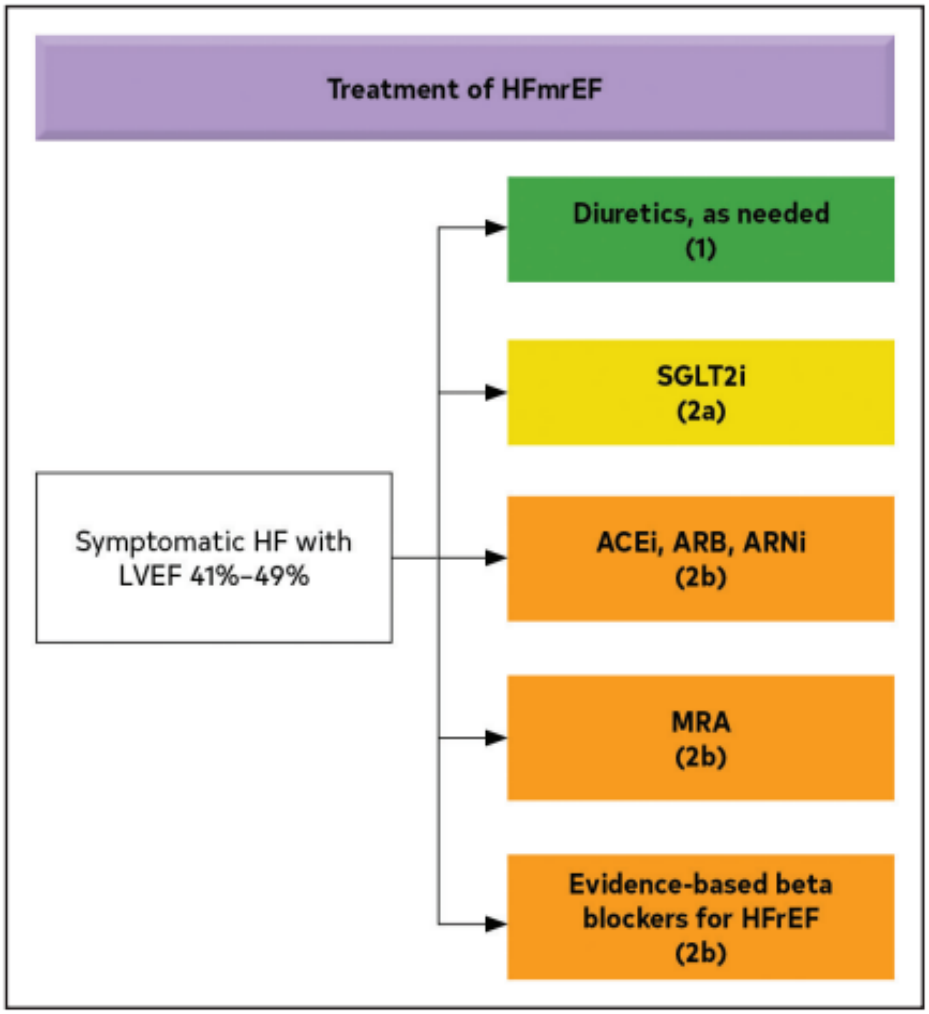
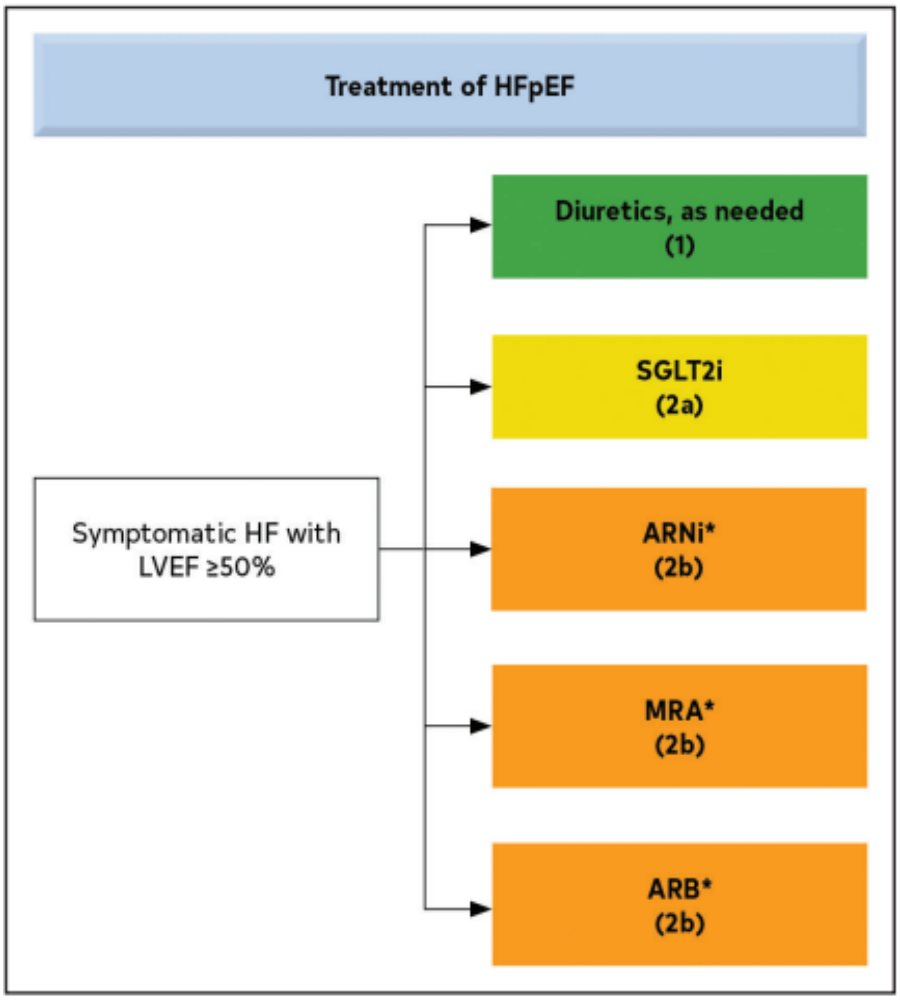


**Figure 7: Offers guidance on treatment strategies for HFpEF, with the initiation of SGLT2i now being a class 2a recommendation (2022).**



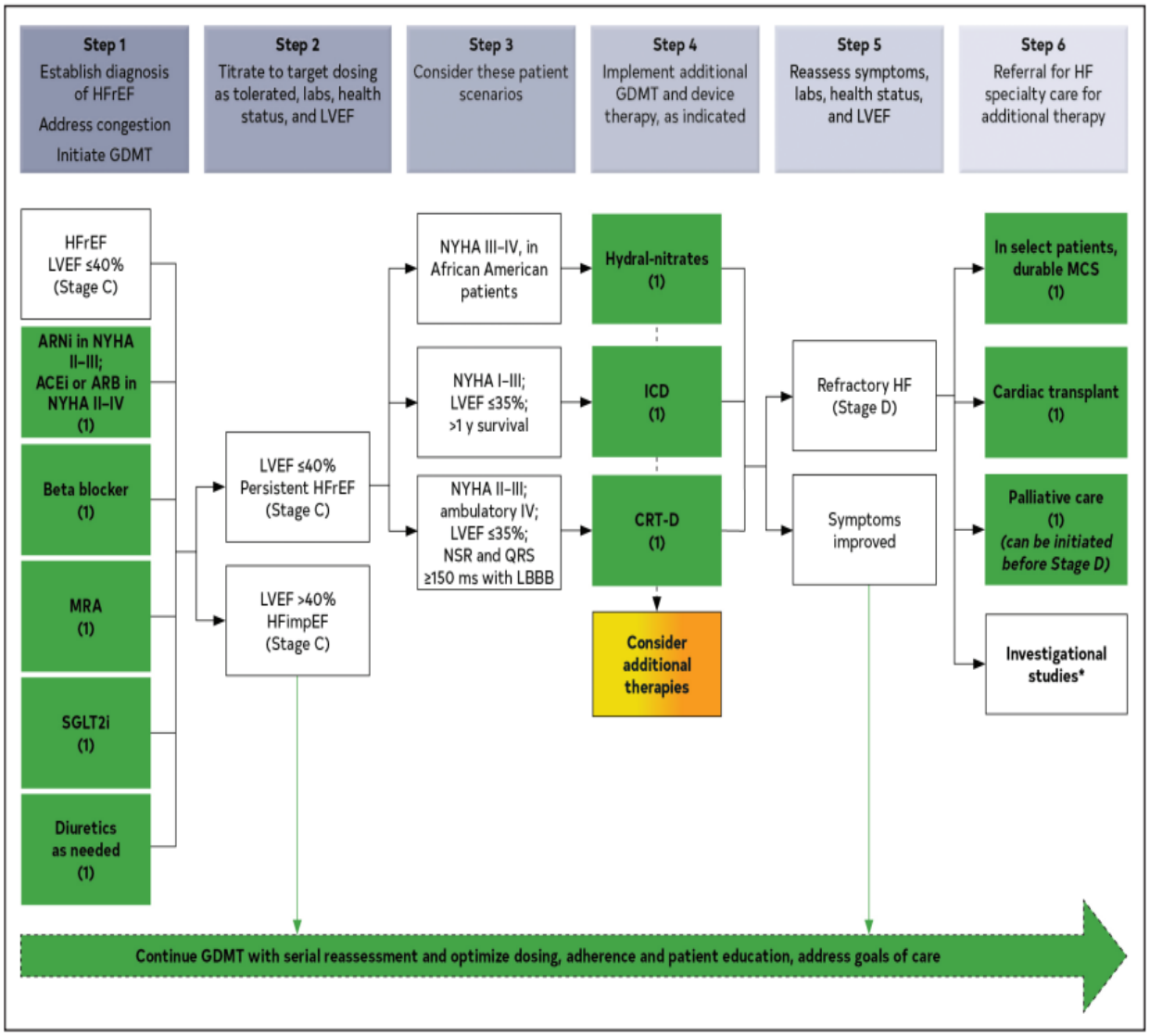



**Figure 8: Treatment of HFrEF Stages C and D. Step 1 medications may be started simultaneously at initial (low) doses recommended for HFrEF. Alternatively, these medications may be started sequentially, with sequence guided by clinical or other factors, without need to achieve target dosing before initiating next medication. Medication doses should be increased to target as tolerated.**

**High Value Statements for initiating GDMT in Stage C and D heart failure:**

- In patient with previous or current symptoms of chronic HFrEF, treatment with an ARNi instead of ACEi provides high economic value. If ARNi is not feasible, treatment with an ACEi or ARB provides high economic value (COR 1)

- ARNi should NOT be administered concomitantly with ACEi or within 36 hours of the last dose of an ACEi. (COR3: HARM)

- In patient with HFrEF, use of 1 of the 3 beta blockers proven to reduce mortality (bisoprolol, carvedilol, metoprolol succinate) is recommended to reduce morality and hospitalizations (COR 1)

- In patients with HFrEF and NYHA class II to IV symptoms, an MRA is recommended to reduce morbidity and mortality, if eGFR is >30 and serum potassium is <5.0. Careful monitoring of potassium, renal function and diuretic dosing should be performed at initiation and thereafter (COR 1)

- In patient with symptomatic chronic HFrEF, SGLT2 are recommended to reduce hospitalization for HF and cardiovascular mortality, irrespective of the presence of type 2 diabetes (COR 1)

- For patients self-identified as African American with NYHA class III-IV HFrEF who are receiving optical medical therapy, the combination of hydralazine and isosorbide dinitrate is recommended to improve symptoms and reduce morbidity and mortality (COR 1).

- In patients with HFrEF, titration and optimization of GDMT as frequently as every 1 to 2 weeks depending on the patients' symptoms, vital signs and laboratory findings can be useful to optimize management (COR 2a).

- For patients with symptomatic (NYHA class II to III) stable chronic HFrEF (LVEF < or equal to 35%) who are receiving GDMT, including a beta blocker at maximum tolerated dose, and who are in sinus rhythm with a hear rate of > or equal to 70 bpm at rest, ivabradine can be beneficial to reduce HF hospitalizations and cardiovascular death (COR 2a)

**Figure 9: Recommendations for additional therapies that may be considered for patients with HF already on optimal GDMT (2022)**

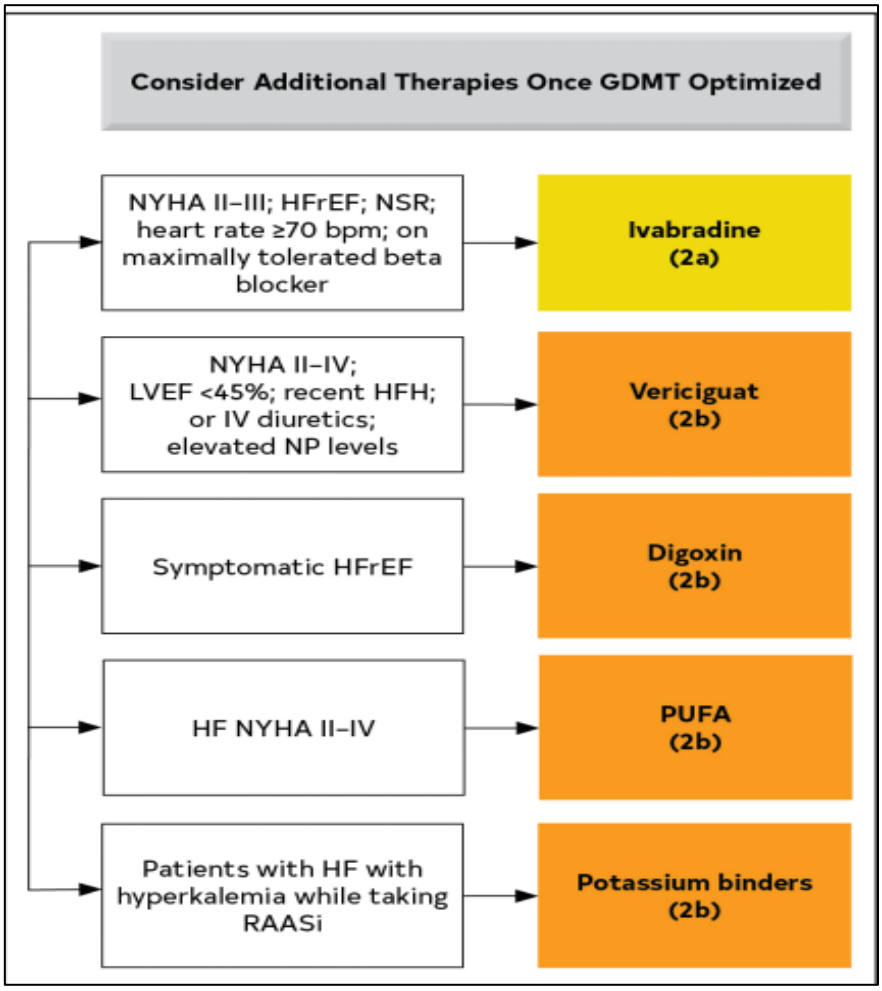


**Figure 10: Algorithm for CRT Indications in Patients with Cardiomyopathy or HFrEF**

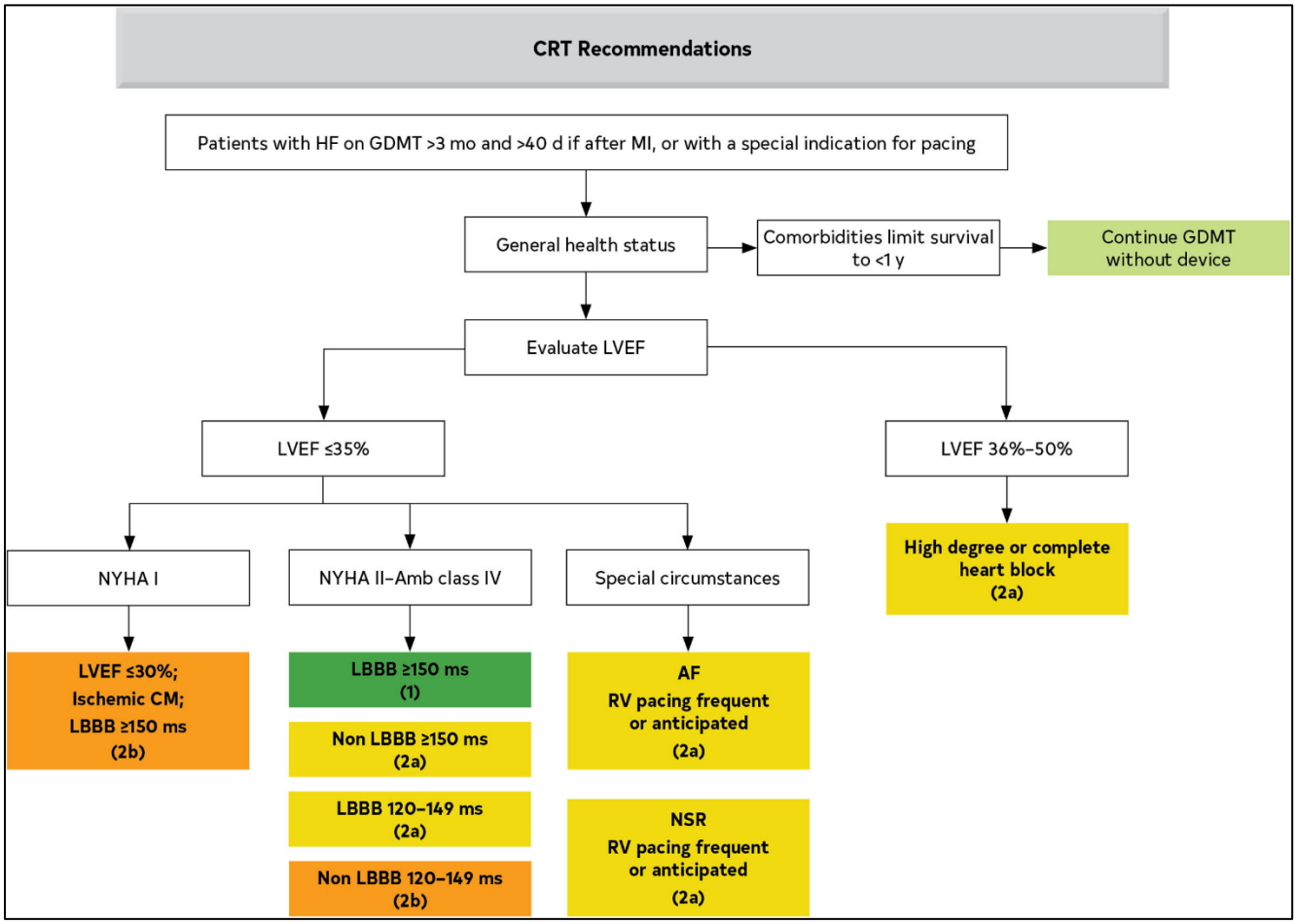


**Table 2: Offers guidance on optimal transitional care planning for patients with HF being discharged from the hospital (2022).**

**Table 25. Important Components of a Transitional Care Plan**

| A transitional care plan, communicated with the patient and their outpatient clinicians before hospital discharge, should clearly outline plans for: |
|---|
| Addressing any precipitating causes of worsening HF identified in the hospital; |
| Adjusting diuretics based on volume status (including weight) and electrolytes; |
| Coordination of safety laboratory checks (eg, electrolytes after initiation or intensification of GDMT); |
| Further changes to optimize GDMT, including:<br>Plans for resuming medications held in the hospital;<br>Plans for initiating new medications;<br>Plans for titration of GDMT to goal doses as tolerated; |
| Reinforcing HF education and assessing compliance with medical therapy and lifestyle modifications, including dietary restrictions and physical activity; |
| Addressing high-risk characteristics that may be associated with poor post-discharge clinical outcomes, such as:<br>Comorbid conditions (eg, renal dysfunction, pulmonary disease, diabetes, mental health, and substance use disorders);<br>Limitations in psychosocial support;<br>Impaired health literacy, cognitive impairment; |
| Additional surgical or device therapy, referral to cardiac rehabilitation in the future, where appropriate; |
| Referral to palliative care specialists and/or enrollment in hospice in selected patients. |

Further recommendations for transition of care suggested include:

- early follow-up within 7 days of hospital discharge is reasonable to optimize care and reduce re-hospitalization (COR 2a), and
- in patients with high-risk HF, referral to a multidisciplinary HF disease management program to reduce risk of hospitalization (COR1)

Early outpatient follow-up, a central element of transitional care, varies significantly across US hospitals.[11] Early post-discharge follow-up may help minimize gaps in understanding of changes to the care plan or knowledge of test results and has been associated with a lower risk of subsequent rehospitalization.

## Table 3: Discusses common barriers to self-care in patients with Heart Failure and offers possible interventions (2022)

**Table 11. Potential Barriers to Effective HF Self-Care and Example Interventions**

| Potential Barrier | Example Screening Tools | Example Interventions |
|---|---|---|
| Medical Barriers | | |
| Cognitive impairment[48–50] | Mini-Cog<br>Mini-Mental State Examination (MMSE)<br>Montreal Cognitive Assessment (MoCA) | Home health aide<br>Home meal deliveries<br>Adult day care<br>Geriatric psychiatry referral<br>Memory care support groups |
| Depression[51,52] | Hamilton Depression Rating Scale (HAM-D)<br>Beck Depression Inventory-II (BDI-II)<br>Patient Health Questionnaire-9 (PHQ-9) | Psychotherapy<br>Selective serotonin reuptake inhibitors<br>Nurse-led support |
| Substance use disorders[53] | Tobacco, Alcohol, Prescription medication, and other Substance use (TAPS) | Referral to social work services and community support partners<br>Referral for addiction psychiatry consultation |
| Frailty[54] | Fried frailty phenotype | Cardiac rehabilitation<br>Registered dietitian nutritionist evaluation for malnutrition |
| Social Barriers | | |
| Financial burden of HF treatments[55] | COmprehensive Score for financial Toxicity–Functional Assessment of Chronic Illness Therapy (COST-FACIT) | PharmD referral to review prescription assistance eligibilities |
| Food insecurity[56,57] | Hunger Vital Sign, 2 items<br>US Household Food Security Survey Module, 6 items | Determine eligibility for the Supplemental Nutrition Assistance Program (SNAP)<br>Connect patients with community partners such as food pantries/food banks<br>Home meal deliveries<br>Registered dietitian nutritionist evaluation for potential malnutrition |
| Homelessness or housing insecurity[58–60] | Homelessness Screening Clinical Reminder (HSCR) | Referral to local housing services<br>Connect patients with community housing partners |
| Intimate partner violence or elder abuse[61,62] | Humiliation, Afraid, Rape, Kick (HARK) questionnaire<br>Partner Violence Screen (PVS)<br>Woman Abuse Screening Tool (WAST) | Referral to social work services and community support partners |
| Limited English proficiency or other language barriers[63] | Routinely inquire in which language the patient is most comfortable conversing | Access to interpreter services covering a wide range of languages, ideally in person or, alternatively, via video platform<br>Printed educational materials in a range of appropriate languages |
| Low health literacy[64] | Short Assessment of Health Literacy (SAHL)<br>Rapid Estimate of Adult Literacy in Medicine–Short Form (REALM-SF)<br>Brief Health Literacy Screen (BHLS), 3 items | Agency for Healthcare Research and Quality (AHRQ) Health Literacy Universal Precautions Toolkit<br>Written education tools provided at sixth grade reading level or below Graphic educational documents |
| Social isolation or low social support[65] | Patient-Reported Outcomes Measurement Information System (PROMIS) Social Isolation Short Form | Determine eligibility for home care services<br>Support group referral |
| Transport limitations | No validated tools currently available. | Referral to social work services<br>Determine eligibility for insurance or state-based transportation, or reduced-cost public transportation<br>Maximize opportunities for telehealth visits and remote monitoring |

## Table 4: Triggers for HF Patient Referral to a Specialist/Program (2021)

**TABLE 6 Triggers for HF Patient Referral to a Specialist/Program**

| Clinical Scenario | |
|---|---|
| | 1. New-onset HF (regardless of EF): Refer for evaluation of etiology, guideline-directed evaluation and management of recommended therapies, and assistance in disease management, including consideration of advanced imaging, endomyocardial biopsy, or genetic testing for primary evaluation of new-onset HF |
| | 2. Chronic HF with high-risk features, such as development or persistence of one or more of the following risk factors:<br>■ Need for chronic intravenous inotropes<br>■ Persistent NYHA functional class III-IV symptoms of congestion or profound fatigue<br>■ Systolic blood pressure ≤90 mm Hg or symptomatic hypotension<br>■ Creatinine ≥1.8 mg/dL or BUN ≥43 mg/dL<br>■ Onset of atrial fibrillation, ventricular arrhythmias, or repetitive ICD shocks<br>■ Two or more emergency department visits or hospitalizations for worsening HF in the prior 12 months<br>■ Inability to tolerate optimally dosed beta-blockers and/or ACEI/ARB/ARNI and/or aldosterone antagonists<br>■ Clinical deterioration, as indicated by worsening edema, rising biomarkers (BNP, NT-proBNP, others), worsened exercise testing, decompensated hemodynamics, or evidence of progressive remodeling on imaging<br>■ High mortality risk using a validated risk model for further assessment and consideration of advanced therapies, such as the Seattle Heart Failure Model |
| | 3. Persistently reduced LVEF ≤35% despite GDMT for ≥3 months: refer for consideration of device therapy in those patients without prior placement of ICD or CRT, unless device therapy is contraindicated or inconsistent with overall goals of care |
| | 4. Second opinion needed regarding etiology of HF; for example:<br>■ Coronary ischemia and the possible value of revascularization<br>■ Valvular heart disease and the possible value of valve repair<br>■ Suspected myocarditis<br>■ Established or suspected specific cardiomyopathies (e.g., hypertrophic cardiomyopathy, arrhythmogenic right ventricular dysplasia, Chagas disease, restrictive cardiomyopathy, cardiac sarcoidosis, amyloid, aortic stenosis) |
| | 5. Annual review needed for patients with established advanced HF in which patients/caregivers and clinicians discuss current and potential therapies for both anticipated and unanticipated events, possible HF disease trajectory and prognosis, patient preferences, and advanced care planning |
| | 6. Assessment of patient for possible participation in a clinical trial |

ACEI = angiotensin converting enzyme inhibitors; ARB = angiotensin receptor blockers; ARNI = angiotensin receptor-neprilysin inhibitor; BNP = B-type natriuretic peptide; BUN = blood, urea, nitrogen; CRT = cardiac resynchronization therapy; EF = ejection fraction; GDMT = guideline-directed medical therapy; HF = heart failure; ICD = implantable cardioverter-defibrillator; LVEF = left ventricular ejection fraction; NT-proBNP = N-terminal pro-B-type natriuretic peptide; NYHA = New York Heart Association; SGLT2 = sodium-glucose cotransporter-2.

The MedStar Health Cardiology Clinical Practice Council recommends that all individuals with new onset HFrEF be referred for a Cardiology Consult. The decision to refer an individual to a heart failure specialist when the clinical scenario outlined above should be a joint decision between the PCP and the cardiologist.

## TABLE 5: Reviews the common comorbidities and potential actions (2021)

| Comorbidity | Association With Heart Failure Outcomes | Clinical Trial Evidence for Modulating Comorbidity | Suggested Action |
|---|---|---|---|
| **Cardiovascular** | | | |
| **Coronary artery disease** | Strong | Strong | ■ Evaluate and revascularize in appropriate patients |
| **Atrial fibrillation/ flutter** | Strong | Intermediate | ■ Treat according to the current AHA/ACC/HRS Guideline for the Management of Patients with Atrial Fibrillation (158,159) |
| **Mitral regurgitation** | Strong | Intermediate | ■ Refer to a structural heart disease expert<br>■ Treat according to the current AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (160,161) and ACC ECDP on the Management of MR (162)<br>■ Consider transcatheter intervention in carefully selected patients with symptomatic HF and secondary MR (163) |
| **Aortic stenosis** | Strong | Strong | ■ Refer to a structural heart disease expert<br>■ Treat according to current AHA/ACC Guidelines for the Management of Patients with Valvular Heart Disease (160,161) |
| **Hypertension** | Uncertain | Strong for prevention | ■ Treat according to current ACC/AHA Guidelines for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (164) |
| **Dyslipidemia** | Uncertain | Strong for prevention | ■ Treat according to current AHA/ACC Guidelines on the Management of Blood Cholesterol (165) and the ACC ECDP on the Role of Non-Statin Therapies for LDL-Cholesterol Lowering in the Management of ASCVD Risk (166) |
| **Peripheral vascular disease** | Moderate | None | ■ Treat according to current AHA/ACC Guidelines on the Management of Patients With Lower Extremity Peripheral Artery Disease (167) |
| **Cerebrovascular disease** | Moderate | Weak | ■ Treat according to current ASA/AHA Guidelines for the Early Management of Patients with Acute Ischemic Stroke (168) |
| **Noncardiovascular** | | | |
| **Obesity** | Moderate (inverse association) | Weak | ■ Further data needed |
| **Chronic lung disease** | Strong | Weak | ■ Smoking cessation<br>■ Optimize therapy<br>■ Consider pulmonary consultation |
| **Diabetes** | Strong | Strong | ■ Optimize therapy<br>■ Administer SGLT2 inhibitor<br>■ Consider consult with endocrinologist<br>■ Treat according to the ACC ECDP on Novel Therapies for CV Risk Reduction in Patients with T2D (31) and ADA Standards of Medical Care in Diabetes (169) |
| **Chronic kidney disease** | Strong | Strong | ■ Optimize RAAS inhibitor therapy<br>■ Use hydralazine/ISDN if an ARNI/ACEI/ARB cannot be used<br>■ Administer SGLT2 inhibitor<br>■ Consider nephrology consult |
| **Anemia** | Moderate | Weak | ■ Evaluate secondary causes<br>■ Consider transfusion in severe cases |
| **Iron deficiency** | Strong | Intermediate | ■ Consider intravenous iron replacement for symptom improvement |
| **Thyroid disorder (hypo or hyper)** | Strong | Weak | ■ Evaluate and initiate treatment<br>■ Consider referral to endocrinologist |
| **Sleep disordered breathing** | Strong | Intermediate; note that in patients with symptomatic HFrEF and central sleep apnea, adaptive servo-ventilation is harmful (170) | ■ Refer for sleep study<br>■ Treat severe obstructive sleep apnea<br>■ Consider referral to sleep medicine specialist |
| **Hyperkalemia** | Uncertain; may limit initiation and titration of GDMT | Weak | ■ Recommend dietary modifications<br>■ Consider treating with patiromer (note: data regarding clinical outcomes are pending [NCT03888066]) or sodium zirconium cyclosilicate |

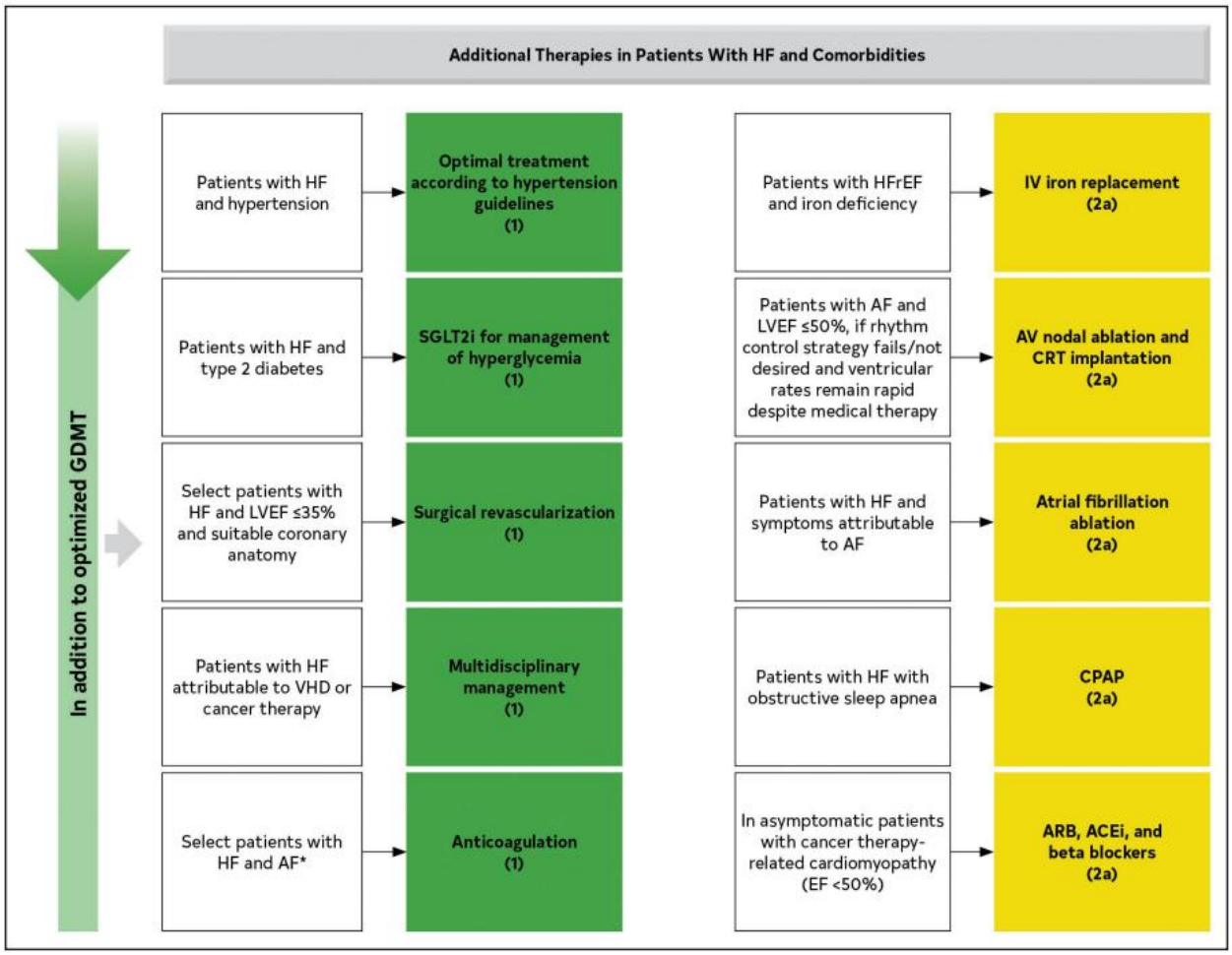



**Figure 11: Offers further guidance on additional therapies for common comorbidities on HF patients from the 2022 ACA update.**

## Patient Education and Resources

**Heart Failure Tools and Resources:**
Heart Failure Tools and Resources | American Heart Association
https://www.cardiosmart.org/topics/heart-failure
https://www.cardiosmart.org/

**Providing Self-Care Education**
Patients at high risk for developing heart failure should be counseled to:

- **implement those behaviors that facilitate self-care, e.g.,**
  - monitor symptoms and weight fluctuations
  - take medications as prescribed
  - stay physically active
  - seek social support
  - change to a healthier lifestyle with an improved diet and exercise
- **avoid behaviors that may increase the risk of heart failure, e.g.,**
  - smoking
  - excessive alcohol consumption and illicit drug use
  - use of non-steroidal anti-inflammatory drugs
  - noncompliance with medical regimen
  - high salt and/or processed food binges

**Sodium Restriction**
Sodium restriction is a reasonable recommendation to improve symptoms in patients with symptomatic HF. Exact restriction levels are unclear, with recommendations differing across organizations. Overall, however, patients should be counseled to reduce sodium in their diets, especially from processed foods.

## References:

1) Heidenreich P, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. *J Am Coll Cardiol.* 2022 May, 79 (17) e263–e421.**https://doi.org/10.1016/j.jacc.2021.12.012**
2) Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE Jr, Drazner MH, Fonarow GC, Geraci SA, Horwich T, Jannuzzi JL, Johnson MR, Kasper EK, Levy WC, Masoudi FA, McBride PE, McMurray JJV, Mitchell JE, Peterson PN, Riegel B, Sam F, Stevenson LW, Tang WHW, Tsai EJ, Wilkoff BL. **2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines.** J Am Coll Cardiol 2013;62: e147–239.
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5) Heidenreich PA, Bozkurt B, Aguilar D, et al. **2022 AHA/ACC/HFSA Heart Failure Guideline: Key Perspectives.** https://www.acc.org/Latest-in-Cardiology/ten-points-to-remember/2022/03/29/19/53/2022-AHA-ACC-HFSA-Heart-Failure-Guideline- (accessed 3/11/2023)