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 2021 American College of Cardiology Expert Consensus Decision Pathway for the Optimization of Heart Failure Treatment\(^1\) and its two companion prior publications from 2013\(^2\) and 2017\(^3\).

With this latest 2021 update, the American College of Cardiology (ACC) hopes 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.

It is an update to the 2013 and 2017 documents cited in the references and is an interim document to bring the latest clinical evidence into practice. A complete and definitive updated guideline is under development by the ACC.

This guideline focuses specifically on the clinical care of individuals with Heart Failure with Reduced Ejection Fraction (HFrEF). Heart Failure with Preserved Ejection Fraction is a topic for a different guideline.

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.

The 2021 Update addresses Ten Pivotal Issues in the care of patients with heart failure with reduced ejection fraction and incorporates the latest evidence from clinical trials and expert opinion presented as a series of tables and treatment algorithms. For the purposes of the update, HFrEF is defined as a left ventricular ejection fraction of \(\leq 40\%\). The document focuses on the ambulatory management of these patients.

The Ten Pivotal Issues addressed are:
1. How to initiate, add, or switch therapies to new evidence-based guideline-directed treatments for HFrEF.
2. How to achieve optimal therapy given multiple drugs for heart failure including augmented clinical assessment (e.g., imaging data, biomarkers, and filling pressures) that may trigger additional changes in guideline-directed therapy.
3. When to refer to a heart failure specialist.
4. How to address challenges of care coordination.
5. How to improve medication adherence.

| Initial Approval Date and Reviews: April 2021 | Most Recent Revision and Approval Date: April 2021 | Next Scheduled Review Date: April 2023 | © Copyright MedStar Health, 2012 |
7. How to manage your patients’ costs and access to heart failure medications.
8. How to manage the increasing complexity of heart failure.
9. How to manage common comorbidities.
10. How to integrate palliative care and the transition into hospice care.

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.

![Diagram](image_url)

<table>
<thead>
<tr>
<th>How to implement GDMT...</th>
<th>How to address challenges with...</th>
<th>How to manage...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue 1. Initiate, Add, or Switch</td>
<td>Trigger for referral to HF specialist (Table 6)</td>
<td>Issue 8. Increasing Complexity</td>
</tr>
<tr>
<td>Treatment algorithm for GDMT including novel therapies (Figures 2 and 3)</td>
<td>Infrastructure for team-based HF care (Table 8)</td>
<td>Twelve pathophysiological targets in HFrEF and treatments (Table 14)</td>
</tr>
<tr>
<td>Issue 2. Titration</td>
<td>Issue 4. Care Coordination</td>
<td>Ten principles and actions to guide optimal therapy</td>
</tr>
<tr>
<td>Target doses, indications, contraindications, and other considerations of select GDMT for HFrEF (Tables 1, 2, 3, 4, 5)</td>
<td>Issue 5. Adherence</td>
<td>Issue 9. Comorbidities</td>
</tr>
<tr>
<td>Considerations for monitoring</td>
<td>Causes of nonadherence (Table 9)</td>
<td>Common cardiovascular and noncardiovascular comorbidities with suggested actions (Table 15)</td>
</tr>
<tr>
<td></td>
<td>Considerations to improve adherence (Table 10)</td>
<td>Issue 10. Palliative/Hospice Care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seven principles and actions to consider regarding palliative care</td>
</tr>
</tbody>
</table>

GDMT = guideline-directed medical therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction.
The 2021 Update continues with the same definitions of Stages and Functional Classification

**ACC/AHA Stages of HF:**
- **Stage A:** At high risk for HF but without structural heart disease or symptoms of HF.
- **Stage B:** Structural heart disease but without signs or symptoms of HF.
- **Stage C:** Structural heart disease with prior or current symptoms of HF.
- **Stage D:** Refractory HF requiring specialized interventions.

**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.

In an accompanying article, Dr. Supriya Shore summarized the ACC update like this:

The following are key points to remember from the 2021 Update to the 2017 ACC Expert Consensus Decision Pathway for Optimization of Heart Failure Treatment:

1. For patients with newly diagnosed Stage C heart failure with reduced ejection fraction (HFrEF), a beta-blocker and an angiotensin-converting enzyme inhibitor (ACEI)/angiotensin receptor blocker (ARB)/angiotensin receptor-neprilysin inhibitor (ARNI) should be started in any order. Each agent should be up-titrated to maximally tolerated or target dose. Initiation of a beta-blocker is better tolerated when patients are dry and an ACEI/ARB/ARNI when patients are wet.
2. Only guideline-recommended beta-blockers (i.e., carvedilol, metoprolol succinate, or bisoprolol) should be used in patients with HFrEF. Among angiotensin antagonists, ARNI are preferred agents. Renal function and potassium should be checked within 1-2 weeks of initiation or dose up-titration of ACEI/ARB/ARNI.
3. Diuretics should be added as needed and dose should be titrated to achieve decongestion. If doses in excess of furosemide 80 mg twice daily are needed, either a different loop diuretic should be considered, or a thiazide should be added.
4. After initiation of beta-blocker and angiotensin antagonist, addition of an aldosterone antagonist should be considered with close monitoring of electrolytes. Sodium-glucose cotransporter-2 (SGLT-2) inhibitors should also be considered for HFrEF with New York Heart Association (NYHA) class II-IV patients.
5. For persistently symptomatic Black patients despite above therapies, hydralazine and isosorbide dinitrate should be considered. In addition, if despite maximally tolerated beta-blocker, resting HR is ≥70 bpm in sinus rhythm, ivabradine may be considered.

6. An ideal time to consider therapy optimization is during hospitalization for HFrEF. As an outpatient, adjustment of therapies should be considered every 2 weeks to achieve guideline-directed medical therapy (GDMT) within 3-6 months of initial diagnosis. An echocardiogram should be repeated 3-6 months after achieving target doses of therapy for consideration of an implantable cardioverter-defibrillator (ICD)/cardiac resynchronization therapy (CRT).

7. Surgical treatment is recommended for patients with severe primary chronic mitral regurgitation. For severe chronic functional mitral regurgitation, optimization of GDMT is recommended prior to consideration of percutaneous transcatheater repair in symptomatic patients only.

8. Hyperkalemia and/or abnormal renal function are common barriers to achieving target medication doses. Patients with hyperkalemia should be educated about a low potassium diet. Potassium binders may be considered.

9. Socioeconomic barriers pose a major barrier to use of ARNI, SGLT-2 inhibitors, and ivabradine. In these cases, financially feasible options should be considered. This may include virtual care and visiting home nursing services particularly during the coronavirus disease 2019 (COVID-19) pandemic.

10. For patients with recovery of left ventricular ejection fraction (LVEF) to >40%, GDMT should be resumed in the absence of a defined, reversible cause.

11. Repeat echocardiograms should be considered in the context of change in clinical status or other high-risk features only. Measuring B-type natriuretic peptide (BNP) or N-terminal–proBNP (NT-proBNP) is useful for risk assessment and decision making regarding referral to a HF specialist or assessing need for other imaging studies. BNP levels may rise with use of ARNI therapy, but NT-proBNP levels are not impacted.

12. Right heart catheterizations should be considered when symptoms persist despite adequate diuretic dose, worsening renal function with attempts to use higher dose therapies including diuretics or those with repeated hospitalizations for decompensation. In highly selected patients with recurrent congestion, an implantable sensor to guide filling pressure assessment (e.g., CardioMEMS) in ambulatory HF patients may be considered.

13. Referral to a HF specialist should be considered in patients needing inotropes, NYHA class IIIB/IV symptoms or persistently elevated natriuretic peptides, end-organ dysfunction, EF ≤35%, ICD shocks, recurrent hospitalizations, congestion despite escalating diuretics, low blood pressure and/or high heart rate, and progressive intolerance to GDMT needing down-titration.

14. Delivering care for HF requires a team-based approach. Infrastructure such as provision of patient monitoring devices (e.g., Scales) or smartphones or electronic health records can support such team-based care.

15. Medication adherence should be assessed regularly. Interventions helping with adherence include patient education, medication management, pharmacist co-management,
cognitive behavioral therapies, medication taking reminders, and incentives to improve adherence.

16. Goals of care should be addressed during the course of illness with HF and expectations should be calibrated to guide timely decisions. When feasible, decision support tools should be used. End-of-life care in HF involves meticulous management of HF therapies, and palliative care consultation may help with other noncardiac symptoms such as pain.

The 2021 document includes the following principles which 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: Transcatheter mitral valve repair may be considered among symptomatic patients with chronic moderate-severe to severe mitral regurgitation despite optimal doses of all GDMTs.
- Principle 9: Focus on the patient’s symptoms, functional capacity, and cardiac function.
- Principle 10: 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 11: 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 ACC Update.

Adapted from Table 1: Guideline Directed Medication Therapy:

<table>
<thead>
<tr>
<th>Medication*</th>
<th>Starting Dose</th>
<th>Target Dose</th>
<th>Common Adverse Effects</th>
<th>Additional Clinical Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Blockers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bisoprolol ($68)</td>
<td>1.25mg once daily</td>
<td>10mg once daily</td>
<td>Headache, Fatigue</td>
<td>May mask symptoms of hypoglycemia in diabetics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Initial Approval Date and Reviews:</th>
<th>Most Recent Revision and Approval Date:</th>
<th>Next Scheduled Review Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2021</td>
<td>April 2021</td>
<td>April 2023</td>
</tr>
<tr>
<td>© Copyright MedStar Health, 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carvedilol Coreg® ($257)</td>
<td>3.125mg twice daily</td>
<td>Weight &lt;85kg: 25mg twice daily Weight 85+kg: 50mg twice daily</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Metoprolol Succinate Toprol XL® ($92)</td>
<td>12.5-25mg daily</td>
<td>200mg daily</td>
</tr>
<tr>
<td><strong>ARNIs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacubitril/valsartan Entresto® ($350 – brand only)</td>
<td>24/26mg-49/51mg daily</td>
<td>97/103mg daily</td>
</tr>
<tr>
<td><strong>ACEIs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Captopril ($261)</td>
<td>6.25mg 3x/day</td>
<td>50mg 3x/day</td>
</tr>
<tr>
<td>Enalapril Vasotec® ($166)</td>
<td>2.5mg twice daily</td>
<td>10-20mg twice daily</td>
</tr>
<tr>
<td>Lisinopril Prinivil®, Zestril® ($47)</td>
<td>2.5-5mg daily</td>
<td>20-40mg daily</td>
</tr>
<tr>
<td>Ramipril Altace® ($67)</td>
<td>1.25mg daily</td>
<td>10mg daily</td>
</tr>
<tr>
<td><strong>ARBs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candesartan Atacand® ($136)</td>
<td>4-8mg daily</td>
<td>32mg daily</td>
</tr>
<tr>
<td>Losartan Cozaar® ($167)</td>
<td>25-50mg daily</td>
<td>150mg daily</td>
</tr>
<tr>
<td>Valsartan Dioven®</td>
<td>40mg twice daily</td>
<td>160mg twice daily</td>
</tr>
</tbody>
</table>

**Initial Approval Date and Reviews:**  
April 2021  
Most Recent Revision and Approval Date: April 2021  
Next Scheduled Review Date: April 2023  
© Copyright MedStar Health, 2012
**Aldosterone Antagonists**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage 1</th>
<th>Dosage 2</th>
<th>Side Effect(s)</th>
</tr>
</thead>
</table>
| Eplerenone  
*Inspira*®  
($130)               | 25mg daily    | 50mg daily    | Hyperkalemia                            |
| Spironolactone  
*Aldactone*®  
($26)               | 12.5-25mg daily | 25-50mg daily | Hyperkalemia  
Gynecomastia |

**SGLT2 Inhibitors**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage 1</th>
<th>Dosage 2</th>
<th>Side Effect(s)</th>
</tr>
</thead>
</table>
| Dapagliflozin  
*Farxiga*®  
($639 – brand only) | 10mg daily    | 10mg daily    | Urinary tract infection  
Diabetic ketoacidosis  
Hypotension  
Must maintain adequate hydration |
| Empagliflozin  
*Jardiance*®  
($658 – brand only) | 10mg daily    | 10mg daily    | Urinary tract infection  
Diabetic ketoacidosis  
Hypotension  
Must maintain adequate hydration |

**Vasodilators**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage 1</th>
<th>Dosage 2</th>
<th>Side Effect(s)</th>
</tr>
</thead>
</table>
| Hydralazine  
($96)               | 25mg 3x/day   | 75mg 3x/day   | Diarrhea  
Loss of appetite |
| Isosorbide dinitrate  
*Isordil Titradose*®  
($214) | 20mg 3x/day   | 40mg 3x/day   | Headache  
Lightheadedness  
PDE 5 inhibitors contraindicated in patients on nitrates |
| Isosorbide dinitrate/hydralazine combination  
(20/37.5mg)  
*BiDil*®  
($828)               | 1 tab 3x/day  | 2 tab 3x/day  | See individual agents |

**Other**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage 1</th>
<th>Dosage 2</th>
<th>Side Effect(s)</th>
</tr>
</thead>
</table>
| Ivabradine  
*Corlanor*®  
($590)               | 2.5-5mg twice daily | Titrated to goal heart rate  
50-60bpm  
Max dose  
7.5mg twice daily | Atrial fibrillation  
Phosphenes  
Take with food  
Available as oral solution if patient unable to swallow tabs |

*AWP for 30 days of medication at maximum target dose unless specified otherwise*
Figure 2 below outlines the strategies for medication management. Note in the upper diamond that all patients should be started on either an ARNI, or ACEI/ARB and a beta blocker with proven efficacy (carvedilol, metoprolol succinate or bisoprolol.)

*ACEI/ARB should only be considered in patients with contraindications, intolerance or inaccessibility to ARNI. In those instances, please consult Figure 3 and text for guidance or initiation.

ACE = angiotensin-converting enzyme inhibitors; ARNI = angiotensin receptor-neprilysin inhibitors; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate; HFrEF = heart failure with reduced ejection fraction; HR = heart rate; K+ = potassium; NYHA = New York Heart Association; SGLT2 = sodium-glucose cotransporter-2.

Green color identifies a Class I therapy from clinical practice guidelines, whereas yellow color indicates a Class II therapy.
FIGURE 3 Guideline-Directed Medical Therapy Including Novel Therapies in the Expert Consensus Decision Pathway for Chronic Heart Failure

A

ARNI

If previously on ACEI, ensure 36 hours off before initiation

Select starting dose:
See Tables 1 and 3 for dosing information
See Table 2 for indications for ARNI use

If patient is taking equivalent of ≤10 mg daily of enalapril or equivalent of ≤160 mg daily of valsartan:
24/26 mg twice daily

If patient is taking equivalent of >10 mg daily of enalapril or equivalent of >160 mg daily of valsartan:
49/51 mg twice daily

In 2 weeks, assess tolerability
If possible, increase dose stepwise to target of 97/103 mg twice daily
Monitor blood pressure, electrolytes, and renal function after initiation and during titration

B

ACEI/ARB

Consider in patients where ARNI administration is not possible

Select initial dose of ACEI or ARB:
See Table 1 for dosing information

Consider increasing dose of ACEI/ARB every 2 weeks until maximum tolerated or target dose is achieved
Monitor blood pressure, renal function, and potassium after initiation and during titration

C

Evidence-based Beta-blockers*

Select initial dose of beta-blocker:
See Table 1 for dosing information

Consider increasing dose of beta-blocker every 2 weeks until maximum tolerated or target dose is achieved
Monitor heart rate, blood pressure, and for signs of congestion after initiation and during titration

ACEI = angiotensin-converting enzyme inhibitors; ARNI = angiotensin receptor-neprilysin inhibitors; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate.
*Carvedilol, metoprolol succinate, or bisoprolol.

ARNIs are the preferred agents, but for patients in whom ARNI administration is not possible, an ACEI/ARB is recommended.
FIGURE 3Continued

**D**

Diuretics

Select initial loop diuretic dose:
Initial dose depends on multiple factors, including renal function and prior exposure to diuretic therapy

Tritrate dose to relief of congestion over days to weeks. In some instances it may be necessary to reduce diuretic dosing in the setting of increasing doses of ARNI/ACEI/ARB
Monitor blood pressure, electrolytes, and renal function after initiation and during titration

If reaching high doses of loop diuretic (i.e., equivalent of 80 mg of furosemide twice daily), consider:
- a. changing to a different loop diuretic or
- b. adding thiazide diuretic, taken together with loop diuretic
Monitor blood pressure, electrolytes, and renal function after initiation and during titration

**E**

Aldosterone antagonists

Select initial dose of aldosterone antagonist:
See Table 1 for dosing information

Consider increasing dose of aldosterone antagonist at least every 2 weeks until maximum tolerated or target dose is achieved
Monitor electrolytes (especially potassium) and renal function at 2-3 days following initiation, and then 7 days after initiation/titration
Then, check monthly for 3 months and every 3 months afterwards
Clinical status may warrant closer monitoring

**F**

SGLT2 inhibitor

Select dapagliiflozin or empagliflozin:
See Table 1 for dosing information
See Table 2 for indications for SGLT2 inhibitor use

Ensure eGFR ≥30 mL/min/1.73 m² for dapagliiflozin and eGFR ≥20 mL/min/1.73 m² for empagliflozin before initiation

ACEI = angiotensin-converting enzyme inhibitors; ARNI = angiotensin receptor-neprilysin inhibitors; ARB = angiotensin receptor blocker; eGFR = estimated glomerular filtration rate; SGLT2 = sodium-glucose cotransporter-2.
**Hydralazine +isosorbide dinitrate**

Select initial dose of hydralazine and isosorbide dinitrate, either as individual medications or fixed-dose combination:

See Table 1 for dosing information

Consider increasing dose of hydralazine and/or isosorbide dinitrate every 2 weeks until maximum tolerated or target dose is achieved

Monitor blood pressure after initiation and during titration

**Ivabradine**

Reassess that beta-blockers are adjusted to maximally tolerated doses and/or target doses

Verify patient is in sinus rhythm

See Table 1 for target beta-blocker doses

See Table 2 for indications for ivabradine therapy

Select starting dose of ivabradine:

See Tables 1 and 4 for dosing information

- **Age ≥75 years**
  - 2.5 mg twice daily with food
- **Age <75 years**
  - 5.0 mg twice daily with food

Reassess heart rate in at least 2–4 weeks

- **Heart rate <50 beats/min or symptoms of bradycardia**
  - Reduce dose by 2.5 mg twice daily with food or discontinue if already at 2.5 mg twice daily with food
  - Monitor heart rate
- **Heart rate 50-60 beats/min**
  - Maintain current dose and monitor heart rate
- **Heart rate >60 beats/min**
  - Increase by 2.5 mg twice daily with food until reaching maximum dose of 7.5 mg twice daily with food
  - Monitor heart rate
Table 4: Reviews the contraindications of the relatively new therapies – ARNI, Ivabradine and SGLT2 inhibitors

Table 5: Describes the recommended starting doses for Ivabradine

Figure 4: Offers guidance on the evaluation and management – short and long term.
Table 6: Triggers for HF Patient Referral to a Specialist/Program

<table>
<thead>
<tr>
<th>Clinical Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>2. Chronic HF with high-risk features, such as development or persistence of one or more of the following risk factors:</td>
</tr>
<tr>
<td>■ Need for chronic intravenous inotropes</td>
</tr>
<tr>
<td>■ Persistent NYHA functional class III–IV symptoms of congestion or profound fatigue</td>
</tr>
<tr>
<td>■ Systolic blood pressure ≤90 mm Hg or symptomatic hypotension</td>
</tr>
<tr>
<td>■ Creatinine ≥1.8 mg/dl or BUN ≥43 mg/dl</td>
</tr>
<tr>
<td>■ Onset of atrial fibrillation, ventricular arrhythmias, or repetitive ICD shocks</td>
</tr>
<tr>
<td>■ Two or more emergency department visits or hospitalizations for worsening HF in the prior 12 months</td>
</tr>
<tr>
<td>■ Inability to tolerate optimally dosed beta-blockers and/or ACE/ARB/ARNI and/or aldosterone antagonists</td>
</tr>
<tr>
<td>■ Clinical deterioration, as indicated by worsening edema, rising biomarkers (BNP, NT-pro-BNP, others), worsened exercise testing, decompensated hemodynamics, or evidence of progressive remodeling on imaging</td>
</tr>
<tr>
<td>■ High mortality risk using a validated risk model for further assessment and consideration of advanced therapies, such as the Seattle Heart Failure Model</td>
</tr>
<tr>
<td>3. Persistently reduced LVEF ≤30% 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</td>
</tr>
<tr>
<td>4. Second opinion needed regarding etiology of HF, for example:</td>
</tr>
<tr>
<td>■ Coronary ischemia and the possible value of revascularization</td>
</tr>
<tr>
<td>■ Valvular heart disease and the possible value of valve repair</td>
</tr>
<tr>
<td>■ Suspected myocardiitis</td>
</tr>
<tr>
<td>■ Established or suspected specific cardiomyopathies (e.g., hypertrophic cardiomyopathy, arrhythmogenic right ventricular dysplasia, Chagas disease, restrictive cardiomyopathy, cardiac sarcoidosis, amyloid, aortic stenosis)</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>6. Assessment of patient for possible participation in a clinical trial</td>
</tr>
</tbody>
</table>

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 in 2 above should be a join decision between the PCP and the cardiologist.
### TABLE 15: Reviews the common comorbidities and potential actions

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

**Initial Approval Date and Reviews:**
April 2021

**Most Recent Revision and Approval Date:**
April 2021

**Next Scheduled Review Date:**
April 2023
Patient Education and Resources

Patient Self Care Education (Outpatient Setting)

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:


