



# Adults with Heart Failure with Reduced Ejection Fraction

The following guideline recommends diagnostic evaluation, pharmacologic treatment and education that support effective patient self-management.

Eligible Population	Key Components	Recommendation and Level of Evidence
Adults with suspected heart failure, with reduced or mildly reduced ejection fraction (EF<50%)	Evaluation	<p><u>Initial assessment should include:</u>                      Thorough history and physical examination <b>[C]</b>, including depression screening, and assessment for coronary artery disease and risk factors.                      Testing includes: chest X-ray, 12-lead electrocardiogram, lipid profile, CBC, comprehensive metabolic panel and magnesium, TSH, urinalysis, and echocardiography with Doppler. <b>[C]</b>                      Natriuretic peptide levels (e.g., BNP and NT-proBNP) are useful for diagnosis. NT-proBNP is preferred for those on ARNI therapy. <b>[B]</b>                      Serial monitoring should include: weight, volume status, electrolytes, renal function and activity tolerance.</p>
Adults with heart failure with reduced ejection fraction	Management	<p><u>Recommended for routine use:</u>                      ACE inhibitors <b>[A]</b>, ARB's <b>[A]</b> or Angiotensin receptor blocker/neprilysin inhibitor (AR/NI) in all patients unless contraindicated<sup>1</sup>, but drugs from these classes should not be used together. <b>[A]</b>                      Consider hydralazine and isosorbide dinitrate for patients who cannot tolerate ACE inhibitors or ARBs <b>[A]</b>, or as an adjunct treatment for patients who self-identify as African-American who remain symptomatic despite standard therapy.<sup>2</sup>                      Beta-blockade using carvedilol, sustained-release metoprolol, or bisoprolol in all stable patients, unless contraindicated<sup>1,3</sup> <b>[A]</b>                      Mineralocorticoid Receptor Antagonists (e.g., spironolactone, eplerenone) for patients with symptoms of heart failure, preserved renal function (creatinine &lt; 2.0 in women; creatinine &lt; 2.5 in men) and normal serum potassium concentration. <b>[A]</b>                      Sodium-Glucose Cotransporter 2 Inhibitors (SGLT2i, e.g. empagliflozin, dapagliflozin) <u>should be used in all patients, unless contraindicated, including those with or without type 2 diabetes</u> <b>[A]</b> Contraindicated in Type I diabetes. Use with caution in patients with eGFR&lt;30 (limited data).<sup>4</sup>                      Diuretics and sodium restriction for evidence of fluid retention. <b>[A]</b>                      Digoxin should only be used for patients who remain symptomatic despite optimized use of diuretics, ACE inhibitors, ARBs and beta blockers. <b>[A]</b>;                      Referral to heart failure specialist is recommended.                      Ivabradine for patients with symptomatic HF, LVEF &lt;35%, on maximally tolerated (or target) beta blocker dose, in sinus rhythm with rate &gt;70 bpm, and if hospitalized within the last year. <b>[A]</b> Referral to heart failure specialist is recommended.                      IV (not oral) iron for patients with anemia and ferritin &lt; 100 ug/L or 100-300 ug/L and transferrin saturation &lt;20%. <b>[A]</b>                      Vaccination against influenza and pneumococcal disease <b>[B]</b> and any other <u>age- and condition-specific CDC recommended vaccines</u>.  <u>Recommended for use in select patients:</u>                      Referral for cardiac resynchronization therapy (e.g., biventricular pacemaker) for patients with symptomatic heart failure and QRS duration ≥ 120 msec. <b>[A]</b>                      Referral for evaluation for implantable defibrillator in patients with LVEF &lt;35% and either symptomatic heart failure or ischemic cardiomyopathy. <b>[A]</b>                      Consider referral of complex patients to an advanced heart failure management program, including one that specializes in heart failure rehabilitation.                      Based on current evidence, guideline directed medical therapy should be continued indefinitely. <b>[B]</b></p>
	Counseling and care management	<p><u>Engage patients in office-based care management and self-management:</u></p> <ul style="list-style-type: none"> <li>◆ Careful review of medication regimen with patient and caregivers at hospitalization or other changes in treatment</li> <li>◆ Daily self-monitoring of weight and adherence to recommended patient action plan</li> <li>◆ Recognition of symptoms and when to seek medical attention</li> <li>◆ Moderate dietary sodium restriction (e.g., 2,000-2,500 mg sodium/day)</li> <li>◆ Risk factor modification (regular exercise 5 times per week as tolerated; smoking cessation; control of BP, DM, lipids)</li> <li>◆ Avoid excessive alcohol intake, illicit drug use, and the use of NSAIDs</li> <li>◆ Discuss goals of care, prognosis, advance directives, and palliative care; reassess goals of care as disease progresses</li> </ul>

<sup>1</sup>Contraindications include: life-threatening adverse reactions (angioedema or anuric renal failure), pregnancy, hypotensive patients at immediate risk of cardiogenic shock, systolic blood pressure < 80 mm Hg, serum creatinine > 3 mg/dL, bilateral renal artery stenosis, or serum potassium > 5.5 mmol/L.

<sup>2</sup><https://www.ahajournals.org/doi/10.1161/CIR.0000000000001063>

<sup>3</sup>Contraindications include: patients with current or recent fluid retention history, unstable or poorly controlled reactive airway disease, symptomatic bradycardia or advanced heart block (unless treated with a pacemaker), or recent treatment with an intravenous positive inotropic agent.

<sup>4</sup>SGLT2i contraindicated for eGFR<20, limited data for eGFR <30.

**Levels of Evidence for the most significant recommendations:** A = randomized controlled trials; B = controlled trials, no randomization; C = observational studies; D = opinion of expert panel

This guideline lists core management steps. It is based on the 2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure: An Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure; and 2013 ACC/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Developed in Collaboration With the American College of Chest Physicians, Heart Rhythm Society and International Society for Heart and Lung Transplantation. Individual patient considerations and advances in medical science may supersede or modify these recommendations. [2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure" Circ 2022:145e895-1032.](https://www.ahajournals.org/doi/10.1161/CIR.0000000000001063)