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# Heart failure: ACC/AHA Guideline for the Management of Heart Failure

## About the Guideline

- The purpose of this guideline is to update the ACC/AHA Guideline for the Management of Heart Failure to incorporate current 2022 changes in areas where new evidence has become available.
- Reviewing this guideline were two official reviewers, each nominated by the American College of Cardiology (ACC), American Heart Association (AHA), and the Heart Failure Society of America (HFSA); one reviewer each from the American Academy of Family Physicians, American College of Chest Physicians, and International Society for Heart and Lung Transplantation; and 19 individual content reviewers.

## Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting or care for adult patients with heart failure.

**Definition**

Heart failure (HF) is a clinical syndrome that results from any structural or functional impairment of the ventricular filling or ejection of blood.

**Initial Evaluation**

- A careful history and physical exam remain the cornerstones of patient assessment.
- Determine what caused or exacerbated the development or acceleration of HF.
- Assess volume status—weight, dyspnea, orthopnea, jugular vein distention (JVD).

**Diagnostic Testing**

- Bloodwork, including cardiac B-type natriuretic peptide (BNP) or N-terminal pro-B-type natriuretic peptide (NT-proBNP) (on admission and discharge), electrolytes, blood urea nitrogen (BUN), creatinine, thyroid, liver function tests, complete blood count (CBC), lipids, iron studies, and thyroid stimulating hormone (TSH)
- Electrocardiogram (ECG)
- Chest x-ray (CXR) for patients with suspected or new-onset HF or those presenting with acute decompensated HF
- Echocardiogram on initial evaluation and repeated with a clinical change; essential to determine left ventricular (LV) function (reduced or preserved ejection fraction) and to assure appropriate treatment
- Coronary angiography/stress testing
    - Coronary artery disease (CAD) is a primary cause of LV dysfunction; an ischemic workup is recommended in patients with suspected CAD.
- Invasive hemodynamic testing for patients whose volume status or perfusion is uncertain; not recommended for routine management of acute decompensated HF

**Treatment of Heart Failure**

Stage A — Patients at risk for developing HF

- Control risk factors such as hypertension, obesity, smoking, diabetes, certain illicit drugs, and certain chemotherapy drugs.

Stage B — Patients with structural heart changes but no clinical signs of HF

- Control risk factors.
- Medications include the following:
    - Angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) and a beta blocker (BB) for all patients with an ejection fraction (EF) less than 40%
        - ACE inhibitors (enalapril, lisinopril, ramipril)
        - ARB (losartan, valsartan) if patient is ACE intolerant
        - Beta blocker (carvedilol, metoprolol succinate, or bisoprolol; there are only three guideline-directed medical therapy [GDMT] beta blockers per HF guidelines)
- Implanted cardiac defibrillator (ICD) if patient is at least 40 days post-myocardial infarction (MI), has an EF less than 30%, and is on GDMT, as indicated above.
- Calcium channel blockers may be harmful in patients with a low EF.

Stage C — Patients with structural heart changes who have developed symptoms of HF

- Includes all treatments in stages A and B above
- Care should be provided by a multidisciplinary team to address GDMT, education, and barriers to care.
- Determine if patient has HF with preserved EF (HFpEF) or HF with reduced EF (HFrEF).
- Pharmacologic treatment for HFrEF (EF less than 40%)
    - Angiotensin receptor neprilysn inhibitor (ARNi) (New York Heart Association [NYHA] class II-III HF)
        - Observe for angioedema.
        - Do not administer within 36 hours of an ACE inhibitor.

        **OR**
    - ACE inhibitor or ARB (NYHA class II-IV HF) **and** a GDMT BB (carvedilol, metoprolol succinate, or bisoprolol)
    - Aldosterone antagonist (mineralocorticoid receptor antagonist [MRA]) (spironolactone, eplerenone) (NYHA class II-IV HF) if glomerular filtration rate (GFR) is greater than 30 ml/min and serum potassium is less than 5.0 mEq/L
    - Sodium-dependent glucose cotransporter 2 (SGLT2) inhibitor: empagliflozin or dapagliflozin
        - Increase risk of genital infections
        - Euglycemic ketoacidosis
        - Adjustment of diuretics (natriuresis)
    - Loop diuretic for all volume overloaded patients (furosemide, bumetanide, torsemide)
    - Hydralazine/nitrate (BiDil) for persistently symptomatic African American patients in addition to an ARNi, BB, and MRA

    - Ivabradine
        - Normal sinus rhythm (NSR)
        - Receiving maximum BB dose
        - Heart rate greater than 70
    - Calcium channel blockers and non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided.
- Device therapy for HFrEF patients receiving GDMT
    - ICD therapy is recommended for primary prevention of sudden cardiac death (SCD).
    - Left ventricular EF (LVEF) less than or equal to 35%, on chronic GDMT
- Cardiac resynchronization therapy (CRT)
    - LVEF less than or equal to 35%, on chronic GDMT
    - Sinus rhythm
    - QRS greater than 150 ms
    - NYHA class II or III HF, or ambulatory IV symptoms on GDMT
- Pharmacologic treatment for HFpEF (EF greater than 50%)
    - A SGLT2 may be beneficial.
    - Systolic and diastolic blood pressure should be controlled according to guidelines.
    - Diuretics can provide relief from the symptoms of volume overload.
    - Manage atrial fibrillation according to guidelines.
    - MRAs may be beneficial for some patients.
- Patient teaching
    - Self-care education includes sodium restriction (less than 3 g/day), daily weight, reportable signs and symptoms, regular physical activity, medications, and the importance of follow-up care.
    - Routine fluid restriction in the absence of hyponatremia is not recommended.
    - Assess for and treat sleep apnea.
    - Common medications to avoid as they may exacerbate HF: NSAIDs, calcium channel blockers (especially diltiazem and verapamil), flecainide, sotolol

Stage D — Persistent HF symptoms despite maximum GDMT, more than one hospitalization in six months, inability to tolerate GDMT, decreased functional capacity, progressive renal dysfunction, decreasing serum sodium, and decreased response to diuretics

- Includes all medications listed above, as tolerated.
- Consider inotropes to temporarily relieve cardiogenic shock and as a bridge to the decision for advanced therapies or for palliation of symptoms.
- Consider mechanical circulatory support or transplantation in selected patients.
- Fluid restriction may be useful in stage D, especially if hyponatremia is present.
- Establish patient end-of-life goals of care.

**Hospitalized Patients**

- Continue treatment as above for those in stage C and stage D.
- Make an initial assessment of hemodynamic profile (warm/wet; cold/wet; cold/dry) to guide treatment.

- Identify precipitating factors:
    - GDMT should be continued and optimized if tolerated.
    - Diuretics: IV diuretics should be given in a dose that is greater than or equal to the patient's home dose, as either an intermittent or continuous infusion.
    - Careful monitoring of intake and output, and daily weight.
    - Assess for symptom relief, avoid (symptomatic) hypotension and worsening renal function.
    - Right heart catheterization should be utilized if unable to determine volume status.
- If diuretic response is not adequate:
    - Increase diuretic dose.
    - Add a thiazide diuretic.
    - Add a low-dose dopamine infusion while administering IV loop diuretics to improve diuresis and preserve renal function.
    - Consider ultrafiltration.
    - Administer IV vasodilators along with diuretics to relieve congestion.
        - Nitroglycerine, nitroprusside, or neseritide
- Assess readiness for discharge.
    - Assess for need to referral for multidisciplinary HF disease management team.
    - Address precipitating causes of HF exacerbation.
    - Assess volume status/orthostasis/functional capacity.
    - Optimize GDMT.
    - Assess renal function and electrolytes.
    - Provide HF self-care education.
    - Consider palliative or hospice care when appropriate.
    - Assure early follow-up visit (1 week after discharge) with clinician and early post-discharge telephone call.

**Disparities and Vulnerable Populations**

- HF risk assessments and multidisciplinary management strategies should target social determinants of health along with known risks for cardiovascular disease to eliminate disparate HF outcomes.
- Vulnerable populations
    - Female gender
    - Older adults
    - Populations with a lower socioeconomic status
    - Black populations
    - Hispanic populations
    - Asian and Pacific Islander populations
    - Native American and Alaskan Native populations
- Any health disparities should be monitored and addressed at all levels of care.

**Reference:**

Heidenreich, P. A., Bozkurt, B., Aguilar, D., Allen, L. A., Byun, J. J., Colvin, M. M., Deswal, A., Drazner, M. H., Dunlay, S. M., Evers, L. R., Fang, J. C., Fedson, S. E., Fonarow, G. C., Hayek, S. S., Hernandez, A. F., Khazanie, P., Kittleson, M. M., Lee, C. S., Link, M. S., Milano, C. A., … Yancy, C. W. (2022). 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Circulation*, *145*(18), e895–e1032. https://doi.org/10.1161/CIR.0000000000001063