

Treatment of Heart Failure with Abnormal Left Ventricular Systolic Function in Older Adults



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KEYWORDS

- Heart failure • Myocardial infarction • Beta blockers • Angiotensin-converting enzyme inhibitors
- Nitrates • Aldosterone antagonists • Digoxin • Positive inotropic drugs

KEY POINTS

- Use diuretics and salt restriction in patients with heart failure (HF), abnormal left ventricular (LV) ejection fraction, and fluid retention.
- Use angiotensin-converting enzyme (ACE) inhibitors in patients with HF and abnormal LV ejection fraction.
- Use β -blockers (carvedilol, sustained-release metoprolol succinate, or bisoprolol) in patients with HF and abnormal LV ejection fraction.
- Use angiotensin II receptor blockers if intolerant to ACE inhibitors because of cough or angioneurotic edema in patients with HF and abnormal LV ejection fraction.
- Sacubitril/valsartan may be used instead of an ACE inhibitor or ARB in chronic symptomatic HF and abnormal LV ejection fraction class II or III.

The American College of Cardiology (ACC)/American Heart Association (AHA) guidelines for the evaluation and management of heart failure (HF) define 4 stages of HF.^{1,2} Patients with stage A HF are at high risk of developing HF because of conditions strongly associated with the development of HF.^{1,2} These patients have hypertension, coronary artery disease, diabetes mellitus, a history of cardiotoxic drug therapy, alcohol abuse, a history of rheumatic fever, or a family history of cardiomyopathy. These patients have no evidence of structural heart disease.

Patients with stage B HF have structural heart disease associated with the development of HF, but have never shown symptoms or signs of HF.^{1,2} These patients have a prior myocardial

infarction, left ventricular (LV) hypertrophy or fibrosis, LV dilatation or hypocontractility, or asymptomatic valvular heart disease.^{1,2}

Patients with stage C HF have current or prior symptoms of HF associated with structural heart disease.^{1,2} Patients with stage D HF have advanced structural heart disease and marked symptoms of HF at rest despite maximal medical therapy. These patients require specialized interventions.^{1,2}

TREATMENT OF STAGE A HEART FAILURE

In patients with stage A HF, clinicians should treat hypertension¹⁻⁴ and lipid disorders^{1,2,5-7}; encourage regular exercise; discourage smoking, alcohol consumption, and illicit drug use; control the ventricular

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rate in patients with supraventricular tachyarrhythmias; and use angiotensin-converting enzyme (ACE) inhibitors in patients with atherosclerotic vascular disease, diabetes mellitus, or hypertension.^{1,2} Diabetics should be treated as if they had coronary artery disease.⁸ Educational programs may be needed to increase the use of lipid-lowering drugs.^{9,10}

TREATMENT OF STAGE B HEART FAILURE

The ACC/AHA guidelines recommend in patients with stage B HF treatment with all stage A measures, treatment with ACE inhibitors and β -blockers, and valve replacement or repair for patients with hemodynamically significant valvular stenosis or regurgitation.¹

GENERAL MEASURE FOR TREATMENT OF STAGE C HEART FAILURE

Underlying and precipitating causes of HF should be identified and treated when possible. Hypertension should be treated with diuretics, ACE inhibitors, and β -blockers.^{2,11} Myocardial ischemia should be treated with nitrates and β -blockers.^{2,11}

Older persons who have HF without contraindications to coronary revascularization, and who have exercise-limiting angina pectoris, angina pectoris occurring frequently at rest, or recurrent episodes of acute pulmonary edema despite optimal medical therapy, should undergo coronary angiography. Coronary artery bypass graft surgery or percutaneous transluminal coronary angioplasty should be performed in selected patients with myocardial ischemia attributable to viable myocardium subserved by severely stenotic coronary arteries.

If indicated clinically, selected patients should undergo surgical correction of valvular lesions, surgical excision of a dyskinetic LV aneurysm, surgical correction of a systemic arteriovenous fistula, and surgical resection of the pericardium for constrictive pericarditis. Infective endocarditis should be treated with intravenous antibiotics and with surgical replacement of valvular lesions if indicated clinically. Anemia, infection, bronchospasm, hypoxia, tachyarrhythmias, bradyarrhythmias, obesity, hyperthyroidism, and hypothyroidism should be treated.

Oral warfarin should be given to patients with HF who have prior systemic or pulmonary embolism, atrial fibrillation, or cardiac thrombi detected by 2-dimensional echocardiography.¹² The dose of warfarin administered should achieve an International Normalized Ratio of 2.0 to 3.0. Newer oral anticoagulants such as dabigatran,¹³

rivaroxaban,¹⁴ apixaban,¹⁵ or edoxaban¹⁶ may be used instead of warfarin to prevent thromboembolic events in patients with cystic fibrosis who have nonvalvular atrial fibrillation.

A surgical procedure should be performed if anticoagulant therapy fails to prevent pulmonary embolism. Beriberi heart disease should be treated with thiamine. A transvenous pacemaker should be implanted into the right ventricle of a patient with HF and complete atrioventricular block or severe bradycardia.

Patients with HF should have their sodium intake reduced to 1.6 to 2.0 g of sodium daily (4–5 g of sodium chloride). Spices and herbs instead of sodium chloride should be used to flavor food. Normal fluid intake with sodium restriction is the general recommendation. Fluid intake should be restricted if dilutional hyponatremia develops and the serum sodium concentration falls below 130 mEq/L. Through patient education, patient compliance should be stressed, such as the need for salt restriction, fluid restriction, and daily weight checks.

Patients with HF should avoid exposure to heavy air pollution. Air conditioning is essential for patients with HF who are in hot, humid environments. Ethyl alcohol intake should be avoided. Medications that precipitate or exacerbate HF, such as nonsteroidal antiinflammatory and antiarrhythmic drugs, other than β -blockers, digoxin, amiodarone, and dofetilide, should be stopped (**Box 1**).¹ Regular physical activity, such as walking, should be encouraged in patients with mild-to-moderate HF to improve functional status and to decrease symptoms. Patients with HF who are dyspneic at rest at a low work level may benefit from a formal cardiac rehabilitation program (see **Box 1**).^{1,2,17} A multidisciplinary approach to care is useful.¹⁸ **Box 1** shows the class I recommendations for treating HF with a reduced LV ejection fraction.^{2,19} **Box 2** shows the class IIa recommendations for treating HF with a reduced LV ejection fraction.^{2,19}

DIURETICS

Diuretics are the first-line drugs in the treatment of older patients with HF and volume overload (see **Box 1**). Diuretics decrease venous return, reduce ventricular filling pressures, cause loss of fluid from the body, and decrease symptoms of pulmonary and systemic congestion and edema. Age-related decreases in renal function and in circulating plasma volume may reduce the efficacy of diuretics in elderly patients with HF.

A thiazide diuretic, such as hydrochlorothiazide, may be used to treat elderly patients with

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