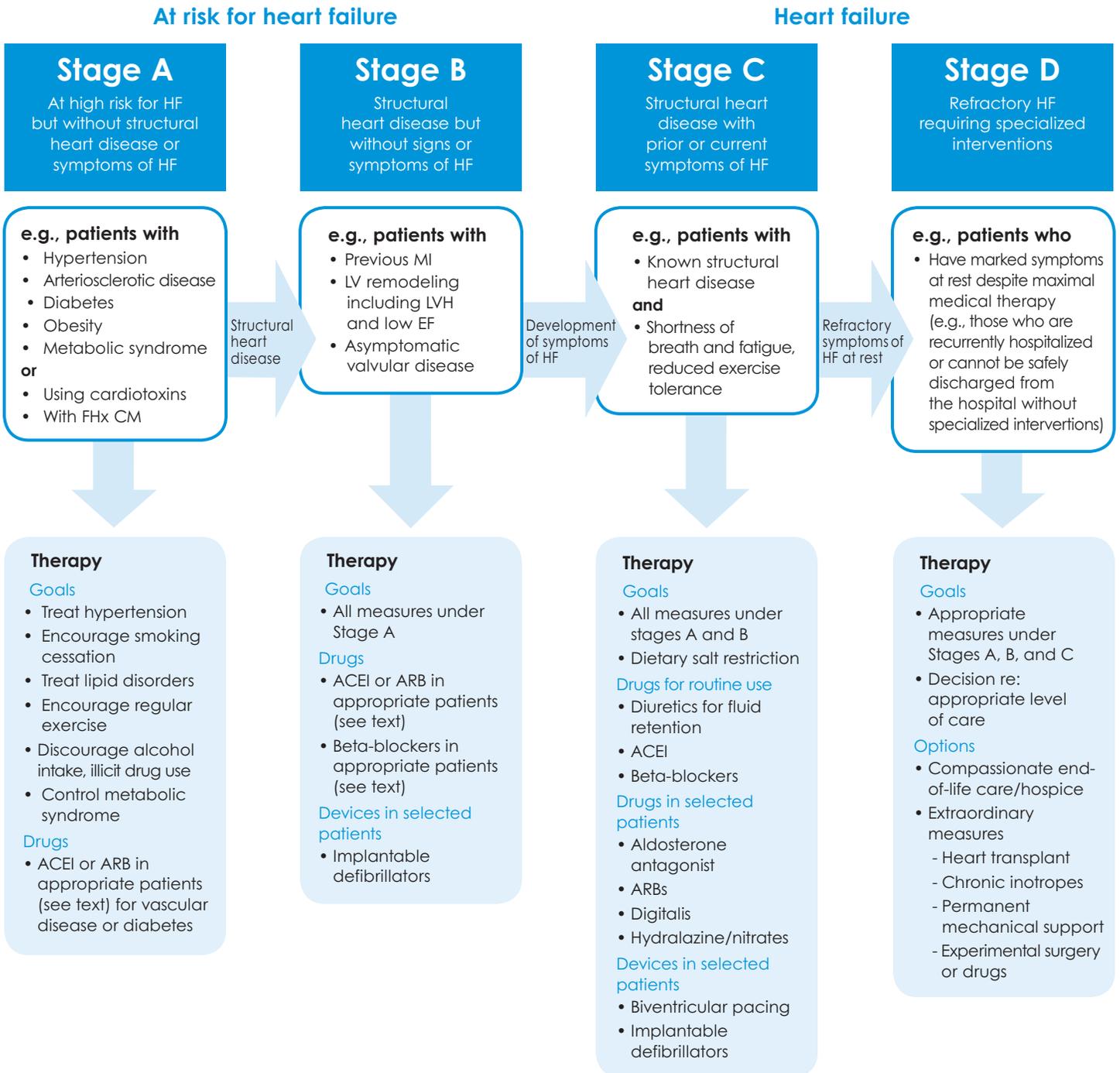


# Heart Failure

Heart failure (HF) is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. The cardinal manifestations of HF are dyspnea and fatigue, which may limit exercise tolerance, and fluid retention, which may lead to pulmonary congestional and peripheral edema.



**Figure 1.** Stages in the Development of Heart Failure/Recommended Therapy by Stage (2009 Focused Update incorporated into the American College of Cardiology (ACC)/American Heart Association (AHA) 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults) ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin II receptor blocker; EF, ejection fraction; FHx CM, family history of cardiomyopathy; HF, heart failure; LV, left ventricular; LVH, left ventricular hypertrophy; and MI, myocardial infarction. Reprinted with permission. © 2009 by the American Heart Association Inc.

**Stages A & B** do not represent HF, but help with early identification of patients who are at risk for developing HF.

**Stage C** denotes patients with current or past symptoms of HF associated with underlying structural heart disease.

**Stage D** designates patients with truly refractory HF who might be eligible for specialized, advanced treatment strategies.

#### **General Measures for HF Management:**

1. Decrease risk of further cardiac injury, including:
  - a. Control of hypertension (< 130/85 or < 130/80 for diabetics), hyperlipidemia (LDL <100 mg/dL for high risk and <70 mg/dL for very high risk), and diabetes as recommended by AHA/ACC, Joint National Committee (JNC) and (NCEP) guidelines.
  - b. Smoking cessation
  - c. Weight reduction for obese patients
  - d. Strict limitation or discontinuation of alcohol.
2. Maintain fluid balance by limiting intake of salt to less than three grams a day and measuring weight daily.
3. Annual influenza vaccination for all persons aged 6 months and older
4. Pneumococcal (pneumonia) vaccination once unless immunocompromised or given more than 5 years before age 65
5. Control ventricular heart rate response in patients with atrial fibrillation or other supraventricular tachycardias.
6. Consider anticoagulation in patients with atrial fibrillation, or a history of an embolic event.
7. Consider coronary revascularization in patients with angina or ischemic but viable myocardium.
8. Avoid certain pharmacologic agents, including NSAIDs, calcium channel blockers, antiarrhythmics other than amiodarone and dofetilide.
9. ICD is recommended for prevention of sudden death in patients with EF <35% who have Class II\_III HF symptoms. For patients who have LVEF  $\leq$ 35%, a QRS duration  $\geq$ 0.12 seconds, and atrial fibrillation, cardio resynchronization therapy (CRT) with or without an ICD is reasonable for New York Heart Association (NYHA) functional class III or ambulatory class IV symptoms who are receiving optimal recommended medical therapy and who have frequent dependence on ventricular pacing.
10. Thyroid function tests (especially TSH) should be measured upon diagnosis, because both hyperthyroidism and hypothyroidism can be a primary or contributory cause of HF.

#### **Patients with HF and Normal LVEF**

1. Control systolic and diastolic hypertension.
2. Control ventricular rate in patients with atrial fibrillation or restore and maintain normal sinus rhythm to improve symptoms.
3. Use diuretics to control pulmonary congestion and peripheral edema.
4. Coronary revascularization is reasonable in patients with CAD who are symptomatic or demonstrate myocardial ischemia with an adverse effect on cardiac function.
5. Use of beta blockers, ACEIs, ARBs or CCBs in patients with controlled hypertension might be effective to minimize symptoms.
6. Usefulness of digitalis to minimize symptoms is not well established.

#### **Patients with Refractory End-Stage Heart Failure (Stage D)**

1. Meticulous identification and control of fluid retention.
2. Referral for cardiac transplantation or LV assist device in eligible patients.
3. Referral of patients to a HF program with expertise in the management of refractory HF is useful.
4. Discuss end-of-life options with patients and family members in patients with refractory end-stage HF that persists despite application of all recommended therapies.
5. Inform patient about the option to inactivate ICD.
6. Continuous IV infusion of positive inotropic agent may be considered for palliation of symptoms.

## Pharmacologic Therapy for HF:

Most HF patients should be routinely managed with a combination of 3 types of drugs: a diuretic, an ACEI or an ARB, and a beta blocker. Therapy with digoxin as a fourth agent may be initiated at any time to reduce symptoms, prevent hospitalization, control rhythm, and enhance exercise tolerance.

<b>ACE Inhibitor/ARB Indications</b>	<ul style="list-style-type: none"><li>• All patients with a recent or remote history of MI regardless of EF or presence of HF.</li><li>• In patients with a reduced EF and no symptoms of HF, even if they have not experienced MI.</li><li>• All patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated.</li><li>• ARB should be administered to patients eligible for, but intolerant of ACEIs.</li></ul>
<b>Beta Blocker Indications</b>	<ul style="list-style-type: none"><li>• All patients with a recent or remote history of MI regardless of EF or presence of HF.</li><li>• All patients without a history of MI who have a reduced LVEF with no HF symptoms.</li><li>• Bisoprolol, carvedilol, and sustained release metoprolol succinate for all stable patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated.</li></ul>
<b>Diuretic Indications</b>	<ul style="list-style-type: none"><li>• In patients with current or prior symptoms of HF and reduced LVEF who have evidence of fluid retention.</li></ul>
<b>Digitalis Indications</b>	<ul style="list-style-type: none"><li>• In patients with current or prior symptoms of HF and reduced LVEF to decrease hospitalizations for HF.</li></ul>
<b>Isordil/Hydralazine Indications</b>	<ul style="list-style-type: none"><li>• In patients self-described as African-Americans, with moderate-severe symptoms on optimal therapy with ACEIs, beta blockers, and diuretics.</li><li>• As additional therapy in patients with reduced LVEF who are already taking an ACEI and beta blocker for symptomatic HF and who have persistent symptoms.</li><li>• In patients with current or prior symptoms of HF and reduced LVEF who cannot be given an ACEI or ARB because of drug intolerance, hypotension, or renal insufficiency.</li></ul>
<b>Aldosterone Antagonist Indications</b>	<ul style="list-style-type: none"><li>• In selected patients with moderately severe to severe symptoms of HF and reduced LVEF who can be carefully monitored for preserved renal function and normal potassium concentration.</li></ul>