2009 Focused Update: ACCF/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults

A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines

Developed in Collaboration With the International Society for Heart and Lung Transplantation

2009 WRITING GROUP TO REVIEW NEW EVIDENCE AND UPDATE THE 2005 GUIDELINE FOR THE MANAGEMENT OF PATIENTS WITH CHRONIC HEART FAILURE WRITING ON BEHALF OF THE 2005 HEART FAILURE WRITING COMMITTEE

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This document is a limited update to the 2005 guideline update and is based on a review of certain evidence, not a full literature review. This document was approved by the American College of Cardiology Foundation Board of Trustees and by the American Heart Association Science Advisory and Coordinating Committee in October 2008.


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useful and effective. Both the class of recommendation and level of evidence listed in the focused updates are based on consideration of the evidence reviewed in previous iterations of the guideline as well as the focused update. Of note, the implications of older studies that have informed recommendations but have not been repeated in contemporary settings are carefully considered.

The ACCF/AHA practice guidelines address patient populations (and healthcare providers) residing in North America. As such, drugs that are not currently available in North America are discussed in the text without a specific class of recommendation. For studies performed in large numbers of subjects outside of North America, each writing committee reviews the potential impact of different practice patterns and patient populations on the treatment effect and on the relevance to the ACCF/AHA target population to determine whether the findings should inform a specific recommendation.

The ACCF/AHA practice guidelines are intended to assist healthcare providers in clinical decision making by describing a range of generally acceptable approaches for the diagnosis, management, and prevention of specific diseases or conditions. The guidelines attempt to define practices that meet the needs of most patients in most circumstances. The ultimate judgment regarding care of a particular patient must be made by the healthcare provider and patient in light of all the circumstances presented by that patient. Thus, there are circumstances in which deviations from these guidelines may be appropriate. Clinical decision making should consider the quality and availability of expertise in the area where care is provided. These guidelines may be used as the basis for regulatory or payer decisions, but the ultimate goals are quality of care and serving the patient’s best interests.

Prescribed courses of treatment in accordance with these recommendations are effective only if they are followed by the patient. Because lack of patient adherence may adversely

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*Data available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as gender, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use. A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Even though randomized trials are not available, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

In 2003, the ACC/AHA Task Force on Practice Guidelines developed a list of suggested phrases to use when writing recommendations. All guideline recommendations have been written in full sentences that express a complete thought, such that a recommendation, even if separated and presented apart from the rest of the document (including headings above sets of recommendations), would still convey the full intent of the recommendation. It is hoped that this will increase readers’ comprehension of the guidelines and will allow queries at the individual recommendation level.

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Table 1. Applying Classification of Recommendations and Level of Evidence

<table>
<thead>
<tr>
<th>SIZE OF TREATMENT EFFECT</th>
<th>CLASS I</th>
<th>CLASS Ia</th>
<th>CLASS Ib</th>
<th>CLASS IIa</th>
<th>CLASS IIb</th>
<th>CLASS III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit &gt;&gt; Risk Procedure/Treatment SHOULD be performed/administered</td>
<td>Recommendation that procedure or treatment is useful/effective</td>
<td>Recommendation in favor of treatment or procedure being useful/effective</td>
<td>Recommendation’s usefulness/efficacy less well established</td>
<td>Recommendation that procedure or treatment is not useful/effective and may be harmful</td>
<td>Recommendation that procedure or treatment is not useful/effective and may be harmful</td>
<td></td>
</tr>
<tr>
<td>Data derived from multiple randomized clinical trials or meta-analyses</td>
<td>Sufficient evidence from multiple randomized trials or meta-analyses</td>
<td>Some conflicting evidence from multiple randomized trials or meta-analyses</td>
<td>Greater conflicting evidence from multiple randomized trials or meta-analyses</td>
<td>Evidence from single randomized trial or nonrandomized studies</td>
<td>Evidence from single randomized trial or nonrandomized studies</td>
<td></td>
</tr>
<tr>
<td>Data derived from a single randomized trial or nonrandomized studies</td>
<td>Recommended procedure or treatment is useful/effective</td>
<td>Evidence from single randomized trial or nonrandomized studies</td>
<td>Recommendation’s usefulness/efficacy less well established</td>
<td>Recommendation that procedure or treatment is not useful/effective and may be harmful</td>
<td>Recommendation that procedure or treatment is not useful/effective and may be harmful</td>
<td></td>
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<tr>
<td>Only expert opinion, case studies, or standard of care</td>
<td>Recommendation in favor of treatment or procedure being useful/effective</td>
<td>Only diverging expert opinion, case studies, or standard of care</td>
<td>Only diverging expert opinion, case studies, or standard of care</td>
<td>Evidence from single randomized trial or nonrandomized studies</td>
<td>Evidence from single randomized trial or nonrandomized studies</td>
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<tr>
<td>Suggested phrases for writing recommendations*</td>
<td>should be recommended</td>
<td>may be reasonable</td>
<td>may be reasonable</td>
<td>may not be reasonable</td>
<td>should not</td>
<td></td>
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<tr>
<td>is indicated</td>
<td>usefulness/efficacy is unknown or uncertain</td>
<td>usefulness/efficacy is unknown or uncertain</td>
<td>usefulness/efficacy is unknown or uncertain</td>
<td>usefulness/efficacy is unknown or uncertain</td>
<td>usefulness/efficacy is unknown or uncertain</td>
<td></td>
</tr>
<tr>
<td>is useful/effective/beneficial</td>
<td>probably recommended or indicated</td>
<td>probably recommended or indicated</td>
<td>probably recommended or indicated</td>
<td>probably recommended or indicated</td>
<td>probably recommended or indicated</td>
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1.4. Stages of Heart Failure: Information From the 2005 Guideline

The HF writing committee previously developed a new approach to the classification of HF, one that emphasized both the development and progression of the disease. In doing so, they identified 4 stages involved in the development of the HF syndrome (Figure 1). The first 2 stages (A and B) are clearly not HF but are an attempt to help healthcare providers with the early identification of patients who are at risk for developing HF. Stages A and B patients are best defined as those with risk factors that clearly predispose toward the development of HF. For example, patients with coronary artery disease, hypertension, or diabetes mellitus who do not yet demonstrate impaired left ventricular (LV) function, hypertrophy, or geometric chamber distortion would be considered Stage A, whereas patients who are asymptomatic but demonstrate LV hypertrophy and/or impaired LV function would be designated as Stage B. Stage C then denotes patients with current or past symptoms of HF associated with underlying structural heart disease (the bulk of patients with HF), and Stage D designates patients with truly refractory HF who might be eligible for specialized, advanced treatment strategies, such as mechanical circulatory support, procedures to facilitate fluid removal, continuous inotropic infusions, or cardiac transplantation or other innovative or experimental surgical procedures, or for end-of-life care, such as hospice.

3. Initial and Serial Clinical Assessment of Patients Presenting With Heart Failure

The changes in this section are made to clarify the role of functional assessment of the HF patient, beyond the New York Heart Association (NYHA) classification, and to expand on the use of B-type natriuretic peptide (BNP) and N-terminal pro-B-type natriuretic peptide (NT-proBNP) testing within the context of the overall evaluation of the patient (Table 2).

3.1. Initial Evaluation of Patients

3.1.1. Identification of Patients

In general, patients with LV dysfunction or HF present to the healthcare provider in 1 of 3 ways:

1. With a syndrome of decreased exercise tolerance. Most patients with HF seek medical attention with complaints of a reduction in their effort tolerance due to dyspnea and/or fatigue. These symptoms, which may occur at rest or during exercise, may be attributed inappropriately by the patient and/or healthcare provider to aging, other physiological abnormalities (e.g., deconditioning), or other medical disorders (e.g., pulmonary disease). Therefore, in a patient whose exercise capacity is limited by dyspnea or fatigue, the healthcare provider must determine whether the principal cause is HF or another abnormality. Elucidation of the precise reason for exercise intolerance can be
Exercise training is beneficial as an adjunctive approach to improve clinical status in ambulatory patients with current or prior symptoms of HF and reduced LVEF.40,93–99 (Level of Evidence: A)

Diuretics and salt restriction are indicated in patients with current or prior symptoms of HF and reduced LVEF who have evidence of fluid retention (see Table 4). (Level of Evidence: B)

Angiotensin converting enzyme inhibitors are recommended for all patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (see text, Table 3 in the full-text guidelines). (Level of Evidence: A)

Beta blockers (using 1 of the 3 proven to reduce mortality, i.e., bisoprolol, carvedilol, and sustained release metoprolol succinate) are recommended for all stable patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (see text, Table 3 in the full-text guidelines). (Level of Evidence: A)

Angiotensin II receptor blockers approved for the treatment of HF (see Table 3) are recommended in patients with current or prior symptoms of HF and reduced LVEF who are ACE inhibitor-intolerant (see text for information regarding patients with angioedema). (Level of Evidence: A)

Drugs known to adversely affect the clinical status of patients with current or prior symptoms of HF and reduced LVEF should be avoided or withdrawn whenever possible (e.g., nonsteroidal anti-inflammatory drugs, most antiarrhythmic drugs, and most calcium channel blocking drugs; see text). (Level of Evidence: B)

Maximal exercise testing with or without measurement of respiratory gas exchange is recommended to facilitate prescription of an appropriate exercise program for patients with HF. (Level of Evidence: C)

Exercise training is beneficial as an adjunctive approach to improve clinical status in ambulatory patients with current or prior symptoms of HF and reduced LVEF.40,93–99 (Level of Evidence: B)

An implantable cardioverter-defibrillator is recommended as secondary prevention to prolong survival in patients with current or prior symptoms of HF and reduced LVEF who have a history of cardiac arrest, ventricular fibrillation, or hemodynamically destabilizing ventricular tachycardia.91–93 (Level of Evidence: A)

Implantable cardioverter-defibrillator therapy is recommended for primary prevention to reduce total mortality by a reduction in sudden cardiac death in patients with ischemic heart disease who are at least 40 days post-MI, have an LVEF less than or equal to 30%, with NYHA functional class II or III symptoms while undergoing chronic optimal medical therapy, and have reasonable expectation of survival with a good functional status for more than 1 year. (Level of Evidence: A)

1. Measures listed as Class I recommendations for patients in stages A and B are also appropriate for patients in Stage C. (Levels of Evidence: A, B, and C as appropriate)

2. Diuretics and salt restriction are indicated in patients with current or prior symptoms of HF and reduced LVEF who have evidence of fluid retention (see Table 4 in the full-text guidelines). (Level of Evidence: C)

3. Angiotensin-converting enzyme inhibitors are recommended for all patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (see text, Table 3 in the full-text guidelines).84–90 (Level of Evidence: A)

4. Beta blockers (using 1 of the 3 proven to reduce mortality, i.e., bisoprolol, carvedilol, and sustained release metoprolol succinate) are recommended for all stable patients with current or prior symptoms of HF and reduced LVEF, unless contraindicated (see text, Table 3 in the full-text guidelines).94–72 (Level of Evidence: A)

5. Angiotensin II receptor blockers (see Table 3 in the full-text guidelines) are recommended in patients with current or prior symptoms of HF and reduced LVEF who are ACE inhibitor-intolerant (see text for information regarding patients with angioedema).73–83 (Level of Evidence: A)

6. Drugs known to adversely affect the clinical status of patients with current or prior symptoms of HF and reduced LVEF should be avoided or withdrawn whenever possible (e.g., nonsteroidal anti-inflammatory drugs, most antiarrhythmic drugs, and most calcium channel blocking drugs; see text).84–90 (Level of Evidence: B)

7. Exercise training is beneficial as an adjunctive approach to improve clinical status in ambulatory patients with current or prior symptoms of HF and reduced LVEF.40,93–99 (Level of Evidence: B)

8. An implantable cardioverter-defibrillator is recommended as secondary prevention to prolong survival in patients with current or prior symptoms of HF and reduced LVEF who have a history of cardiac arrest, ventricular fibrillation, or hemodynamically destabilizing ventricular tachycardia.91–93 (Level of Evidence: A)

9. Implantable cardioverter-defibrillator therapy is recommended for primary prevention to reduce total mortality by a reduction in sudden cardiac death in patients with non-ischemic dilated cardiomyopathy or ischemic heart disease at least 40 days post-MI, a LVEF less than or equal to 35%, and NYHA functional class II or III symptoms while receiving chronic optimal medical therapy, and who have reasonable expectation of survival with a good functional status for more than 1 year.40,93–99 (Level of Evidence: A)

2005 recommendation no longer current. See 2009 Class IIa No. 2 recommendation below.


2005 recommendation remains current but text modified to eliminate specific agents tested.


Modified recommendation to be consistent with the ACC/AHA/Heart Rhythm Society (HRS) 2008 Device-Based Therapy guidelines.
Table 3. Continued

<table>
<thead>
<tr>
<th>2005 Guideline Recommendations</th>
<th>2009 Focused Update Recommendations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class I (Continued)</strong></td>
<td></td>
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<tr>
<td>Implantable cardioverter-defibrillator therapy is recommended for primary prevention to reduce total mortality by a reduction in sudden cardiac death in patients with nonischemic cardiomyopathy who have an LVEF less than or equal to 30%, with NYHA functional class II or III symptoms while undergoing chronic optimal medical therapy, and who have reasonable expectation of survival with a good functional status for more than 1 year. (Level of Evidence: B)</td>
<td>2005 recommendation no longer current. See 2009 Class I No. 9 recommendation above.</td>
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<tr>
<td>Patients with LVEF less than or equal to 35%, sinus rhythm, and NYHA functional class III or ambulatory class IV symptoms despite recommended, optimal medical therapy and who have cardiac dysynchrony, which is currently defined as a QRS duration greater than 120 ms, should receive cardiac resynchronization therapy unless contraindicated. (Level of Evidence: A)</td>
<td>Clarified recommendation (includes therapy with or without an ICD).</td>
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<tr>
<td>Addition of an aldosterone antagonist is reasonable 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. Creatinine should be less than or equal to 2.5 mg per dL in men or less than or equal to 2.0 mg per dL in women and potassium should be less than 5.0 mEq per liter. Under circumstances where monitoring for hyperkalemia or renal dysfunction is not anticipated to be feasible, the risks may outweigh the benefits of aldosterone antagonists. (Level of Evidence: B)</td>
<td>2005 recommendation remains current in 2009 update.</td>
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<tr>
<td><strong>Class IIa</strong></td>
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<tr>
<td>Angiotensin II receptor blockers are reasonable to use as alternatives to ACE inhibitors as first-line therapy for patients with mild to moderate HF and reduced LVEF, especially for patients already taking ARBs for other indications. (Level of Evidence: A)</td>
<td>New recommendation</td>
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<tr>
<td>Digitalis can be beneficial in patients with current or prior symptoms of HF and reduced LVEF to decrease hospitalizations for HF. (Level of Evidence: B)</td>
<td>Modified recommendation (changed class of recommendation from I to IIa).</td>
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<tr>
<td>The addition of a combination of hydralazine and a nitrate is reasonable for patients with reduced LVEF who are already taking an ACE inhibitor and beta-blocker for symptomatic HF and who have persistent symptoms. (Level of Evidence: B)</td>
<td>2005 recommendation remains current in 2009 update.</td>
<td></td>
</tr>
<tr>
<td>Placement of an implantable cardioverter-defibrillator is reasonable in patients with LVEF of 30% to 35% of any origin with NYHA functional class II or III symptoms who are taking chronic optimal medical therapy and who have reasonable expectation of survival with good functional status of more than 1 year. (Level of Evidence: B)</td>
<td>2005 recommendation no longer current. See 2009 Class I No. 9 recommendation above.</td>
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</table>

(continued)
Use of nutritional supplements as treatment for HF is not recommended (Level of Evidence: C)

Calcium channel blocking drugs are not indicated as routine treatment (see recommendations for Stage D) (Level of Evidence: C)

Long-term use of an infusion of a positive inotropic drug may be harmful and is not recommended for patients with current or prior symptoms of HF and reduced LVEF (Level of Evidence: C)

Use of nutritional supplements as treatment for HF is not indicated in patients with current or prior symptoms of HF and reduced LVEF (Level of Evidence: C)

Hormonal therapies other than to replete deficiencies are not recommended and may be harmful to patients with current or prior symptoms of HF and reduced LVEF (Level of Evidence: C)

### Table 3. Continued

<table>
<thead>
<tr>
<th>2005 Guideline Recommendations</th>
<th>2009 Focused Update Recommendations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class IIa</strong> (Continued)</td>
<td></td>
<td></td>
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<tr>
<td>6. For patients who have LVEF less than or equal to 35%, a QRS duration of greater than or equal to 0.12 seconds, and atrial fibrillation (AF), CRT with or without an ICD is reasonable for the treatment of NYHA functional class III or ambulatory class IV heart failure symptoms on optimal recommended medical therapy.2,136 (Level of Evidence: B)</td>
<td>New recommendation added to be consistent with the ACC/AHA/HRS 2008 Device-Based Therapy guidelines.40</td>
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<tr>
<td>7. For patients with LVEF of less than or equal to 35% with NYHA functional class III or ambulatory class IV symptoms who are receiving optimal recommended medical therapy and who have frequent dependence on ventricular pacing, CRT is reasonable.3 (Level of Evidence: C)</td>
<td>New recommendation added to be consistent with the ACC/AHA/HRS 2008 Device-Based Therapy guidelines.</td>
<td></td>
</tr>
</tbody>
</table>

### Class IIb

A combination of hydralazine and a nitrate might be reasonable in patients with current or prior symptoms of HF and reduced LVEF who cannot be given an ACE inhibitor or ARB because of drug intolerance, hypotension, or renal insufficiency. (Level of Evidence: C)

The addition of an ARB may be considered in persistently symptomatic patients with reduced LVEF who are already being treated with conventional therapy. (Level of Evidence: B) (Level of Evidence: C)

### Class III

Routine combined use of an ACE inhibitor, ARB, and aldosterone antagonist is not recommended for patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: C)

Calcium channel blocking drugs are not indicated as routine treatment for HF in patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: A)

Long-term use of an infusion of a positive inotropic drug may be harmful and is not recommended for patients with current or prior symptoms of HF and reduced LVEF, except as palliation for patients with end-stage disease who cannot be stabilized with standard medical treatment (see recommendations for Stage D). (Level of Evidence: C)

Use of nutritional supplements as treatment for HF is not indicated in patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: C)

Hormonal therapies other than to replete deficiencies are not recommended and may be harmful to patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: C)

1. A combination of hydralazine and a nitrate might be reasonable in patients with current or prior symptoms of HF and reduced LVEF who cannot be given an ACE inhibitor or ARB because of drug intolerance, hypotension, or renal insufficiency.119,136,157 (Level of Evidence: C)

2. The addition of an ARB may be considered in persistently symptomatic patients with reduced LVEF who are already being treated with conventional therapy.73-82 (Level of Evidence: B)

3. Long-term use of an infusion of a positive inotropic drug may be harmful and is not recommended for patients with current or prior symptoms of HF and reduced LVEF, except as palliation for patients with end-stage disease who cannot be stabilized with standard medical treatment (see recommendations for Stage D). (Level of Evidence: C)

4. Use of nutritional supplements as treatment for HF is not indicated in patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: C)

5. Hormonal therapies other than to replete deficiencies are not recommended and may be harmful to patients with current or prior symptoms of HF and reduced LVEF. (Level of Evidence: C)

6. For patients who have LVEF less than or equal to 35%, a QRS duration of greater than or equal to 0.12 seconds, and atrial fibrillation (AF), CRT with or without an ICD is reasonable for the treatment of NYHA functional class III or ambulatory class IV heart failure symptoms on optimal recommended medical therapy.2,136 (Level of Evidence: B)

7. For patients with LVEF of less than or equal to 35% with NYHA functional class III or ambulatory class IV symptoms who are receiving optimal recommended medical therapy and who have frequent dependence on ventricular pacing, CRT is reasonable.3 (Level of Evidence: C)

mEq per liter without a history of severe hyperkalemia. In view of the consistency of evidence for patients with low LVEF early after MI and patients with recent decompensation and severe symptoms, it may be reasonable to consider addition of aldosterone antagonists to loop diuretics for some patients with mild to moderate symptoms of HF; however, the writing committee strongly believes that there are insufficient data or experience to provide a specific or strong recommendation. Because the safety and efficacy of aldosterone antagonist therapy have not been shown in the absence of loop diuretic therapy, it is not currently recommended that such therapy be given without other concomitant diuretic therapy in chronic HF. Although 17% of patients in the CHARM (Candesartan in Heart Failure: Assessment of Reduction in Mortality and Morbidity) add-on trial (83) were receiving spironolactone, the safety of the combination of ACE inhibitors, ARBs, and aldosterone antagonists has not been explored adequately, and this combination cannot be recommended.

4.3.1.2.5. Ventricular Arrhythmias and Prevention of Sudden Death. Patients with LV dilation and reduced LVEF frequently manifest ventricular tachyarrhythmias, both nonsus-