

# American College of Cardiology/American Heart Association 2009 clinical guidelines for the diagnosis and management of heart failure in adults

## Update and clinical implications

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**INTRODUCTION** In order to keep pace with the ongoing stream of evidence and to respond more efficiently to new evidence, the American College of Cardiology and the American Heart Association (ACC/AHA) recently published its first “focused update” to the existing guideline recommendations for managing heart failure (HF) in adults. This focused update reflects a change from past practice that resulted in updates and revisions to existing guidelines approximately every 4–5 years. Moving forward, guidelines will be reviewed at least twice a year and updates will be released on an as needed basis.<sup>1</sup> With the exception of the focused update recommendations presented below, the full 2005 guideline recommendations remain current.<sup>2</sup> New to the guidelines is a section on “The Hospitalized Patient”. As in previous years, these guideline recommendations use evidence-based methodologies for determining the strength and level of evidence for each recommendation.<sup>3</sup>

### Initial and serial assessment of patients presenting with heart failure

The only modification is that the measurement of natriuretic peptides (brain natriuretic peptide [BNP] and NT-proBNP) can be useful for risk stratification of patients with diastolic and systolic left ventricular dysfunction (LVD) but should not be employed as targets of therapy (class IIa indication), as the use of BNP to guide medication titration has not been shown to conclusively reduce mortality.<sup>4</sup> All other recommendations from the 2005 document in this section remain current.

### Patients with reduced left ventricular ejection fraction

Based on clinical trial data, there are a number of new recommendations for these patients in the 2009 update. The combination of hydralazine and nitrates is now a Class I recommendation for self-described African-Americans with moderate-severe symptoms who are already receiving angiotensin-converting enzyme (ACE) inhibitors,  $\beta$ -blockers and diuretics. In HF patients with atrial fibrillation, a new Class IIa recommendation is included stressing the importance of maintaining sinus rhythm or on controlling ventricular rates. Maximal exercise testing, with or without respiratory gas exchange, is downgraded from I to IIa, as a means to prescribe an appropriate exercise program for patients with HF.

To provide consistency, a number of modifications for implanted cardiac rhythm management devices are advocated. The use of implantable cardioverter-defibrillator (ICD) therapy is now standardized with the ACC/AHA/HRS (Heart Rhythm Society) 2008 Device-Based Therapy guidelines.<sup>5</sup> In essence, ICDs are recommended for primary prevention of sudden cardiac death in dilated cardiomyopathy or in ischemic heart disease (in patients who are at least 40 days post myocardial infarction), with a left ventricular ejection fraction (LVEF) <35%, and with New York Heart Association (NYHA) functional class II–III symptoms despite optimal medical therapy and who have a reasonable expectation of surviving at least 1 year with good functional status. For secondary prevention, the recommendation for ICDs remains unchanged. The use

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of cardiac resynchronization therapy (CRT) has also been clarified, and CRT with or without an ICD is a class I recommendation for patients with LVEF <35%, in sinus rhythm, with NYHA functional class III or ambulatory class IV symptoms despite optimal medical therapy, and with a QRS duration >0.12 seconds. For these same patients in atrial fibrillation or who are dependent on ventricular pacing, CRT is now deemed reasonable (class IIa indication).

#### **Patients with refractory end-stage heart failure**

Unfortunately for these patients with symptoms at rest or with minimal exertion, there are no new recommendations. These individuals should still be considered for advanced therapies and specialized treatment strategies, such as cardiac transplantation, circulatory assist devices or hospice care, after confirming the accuracy of the HF diagnosis, addressing any contributory conditions, such as thyroid disease, and optimizing conventional medical therapies. When no further therapeutic options are appropriate, options for end-of-life care should be initiated and discussed. The routine intermittent infusion of vasoactive or positive inotropic agents are not recommended (Class III recommendation).

**“The Hospitalized Patient”** This new section focuses on patients who develop acute or worsening symptoms of HF and require hospitalization for management. Admission may be triggered by a number of precipitants, including non-adherence to the prescribed medical or dietary regimen, acute ischemia, arrhythmias or concurrent infections, to name a few, and it is appropriate to discern the precipitating cause. The scope of the new recommendations is based on the evidence resulting from randomized controlled trials of management strategies in acute decompensated HF and begins with the diagnosis of HF. This diagnosis is primarily based on signs and symptoms, in combination with a thorough history and physical examination. Rapid determination of volume status, systemic perfusion, and comorbidities and/or precipitants are essential for improved outcomes.<sup>6</sup>

Since the majority of patients have signs and/or symptoms of congestion, patient management is targeted at eliminating excess volume. Therapy with loop diuretics should be initiated in the emergency department or outpatient clinic without delay, with the initial intravenous dose equal to or exceeding the chronic oral daily dose.<sup>7</sup> Diuretic doses thereafter should be adjusted to urine output, signs and symptoms of congestion, and renal perfusion. When this fails to alleviate congestion, the diuretic regimen should be intensified with higher doses, the addition of a second diuretic, or through continuous infusion. In severely symptomatic patients without systemic hypoperfusion, vasodilators, such as intravenous nitroglycerin, nitroprusside or nesiritide, may be added to the diuretics. In addition, ultrafiltration

may be considered for patients refractory to these above therapies.

Invasive hemodynamic monitoring is recommended for patients with respiratory distress or evidence of hypoperfusion. In addition, it may be useful in selected patients whose fluid status or perfusion status are uncertain, with persistent low systolic blood pressure or worsening renal function, or who may be considered for advanced therapies or cardiac transplantation. However, routine use of hemodynamic monitoring in acute decompensated HF patients with normal blood pressure is not recommended.

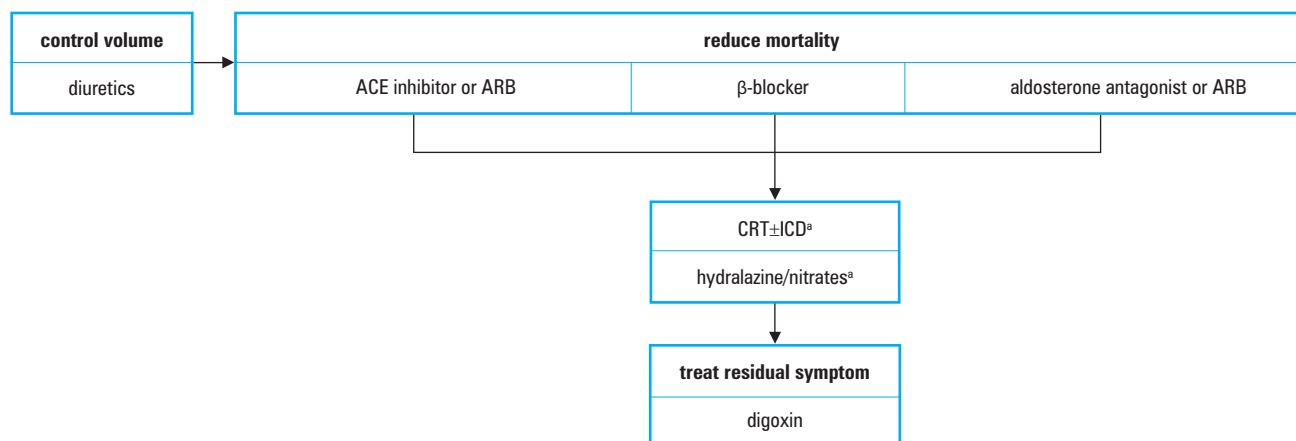
The majority of patients hospitalized should have chronic outpatient medications continued, or even up-titrated, during hospitalization. Withholding or reducing  $\beta$ -blockers may be appropriate for those hospitalized after a recent initiation or increase in this therapy or in cases of marked volume overload. For those not prescribed evidence-based oral therapies known to improve outcomes on admission, particularly ACE inhibitors or angiotensin receptor blockers (ARBs) and specific  $\beta$ -blockers (carvedilol, bisoprolol, or metoprolol CR/XL), it is recommended that these therapies be initiated in stable patients prior to discharge.

All patients and their caregivers should receive written discharge instructions on six aspects of care: diet, medications (emphasizing adherence), activity, follow-up care, daily weight monitoring, and what to do if symptoms worsen. When available, post discharge systems of care, such as home care, should be accessed to facilitate the transition to outpatient care.

**Clinical implications** The mainstays of treatment for chronic systolic heart failure continue to be diuretics to control volume retention and ACE inhibitors or ARBs plus an evidence-based  $\beta$ -blocker to prolong survival (FIGURE). When a two-drug regimen of neurohormonal antagonism is insufficient (due to recurrent symptoms, advanced heart failure, or frequent hospitalizations), an aldosterone antagonist may be added. Occasionally, an ARB is added to a regimen that already includes an ACE inhibitor, but this practice is not strongly endorsed. With any approach employing multiple agents that antagonize the renin-angiotensin system, there is a risk of hypotension, pre-renal azotemia, and hyperkalemia, and patients need to be monitored closely.

Device therapies represent the most recent breakthroughs for the management of chronic systolic heart failure, and the updated guideline strongly advocates their use in selected patients as noted above. Formerly somewhat complex, the primary prevention indication for an ICD has been simplified in the focused update.

For selected patients in order to prolong life, the fixed dose combination of hydralazine and isosorbide dinitrate is recommended. Digoxin has fallen far down the list of therapies for heart failure and is seen as a late option for patients optimized on all other recommended treatments.



**FIGURE** Evidence-based treatment across the spectrum of left ventricular dysfunction and heart failure

**a** for all indicated patients

Abbreviations: ACE – angiotensin-converting enzyme, ARB – angiotensin receptor blocker, CRT – cardiac resynchronization therapy, ICD – implantable cardioverter defibrillator

Unfortunately the updated guideline does not add much to our prior understanding of diastolic heart failure or its treatment. This is because there is little evidence to guide the therapy of patients with heart failure and a preserved LVEF. The most recent studies failed to demonstrate the benefit of ARBs in this patient population. Meticulous management of volume status, control of blood pressure, and management of atrial fibrillation (either through rhythm or rate control) remain cornerstones of treatment.

The focused update does substantially guide the treatment of worsening or decompensated heart failure in hospitalized patients. Prior iterations of the guideline were more conservative in this regard, due to a lack of randomized controlled trials in this population. However, the burden of heart failure hospitalizations remains alarmingly high, and a systematic approach to the evaluation and management of hospitalized patients – now endorsed in these updated guidelines – should be promoted. Of course, such efforts applied in the absence of ongoing disease management and optimization of chronic care are doomed to failure, so that process of care issues directed at continuity of care are essential.

## REFERENCES

- 1 Jessup M, Abraham WT, Casey DE, et al. 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. *Circulation*. 2009; 119: 1977-2016.
- 2 Hunt SA, Abraham WT, Chin M, et al. (2005). ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure): developed in collaboration with the American College of Chest Physicians and the International Society for Heart and Lung Transplantation: endorsed by the Heart Rhythm Society. *Circulation*. 2005; 112: e154-235.
- 3 ACC/AHA Task Force on Practice Guidelines. Manual for ACC/AHA Guideline Writing Committees: Methodologies and Policies from the ACC/AHA Task Force on Practice Guidelines. 2006. Available at <http://www.acc.org/qualityandsafety/clinical/manual/pdfs/methodology.pdf> and <http://circ.ahajournals.org/manual/>. Accessed: April 21, 2009.
- 4 Tang WH, Giord JP, Lee MJ, et al. Plasma B-type natriuretic peptide levels in ambulatory patients with established chronic symptomatic systolic heart failure. *Circulation*. 2003; 108: 2964-2966.
- 5 Epstein AE, DiMarco JP, Ellenbogen KA, et al. ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities: a report of the American College of Cardiology/American Heart

Association Task Force on Practice Guidelines (Writing Committee to Revise the ACC/AHA/NASPE 2002 Guideline Update for Implantation of Cardiac Pacemakers and Antiarrhythmia Devices) developed in collaboration with the American Association for Thoracic Surgery and Society of Thoracic Surgeons. *J Am Coll Cardiol*. 2008; 51: e1-62.

6 Zipes DP, Camm AJ, Borggrefe M, et al. ACC/AHA/ESC 2006 Guidelines for Management of Patients with Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death: a report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death). *J Am Coll Cardiol*. 2006; 48: e247-346.

7 Peacock WF, Fonarow GC, Emerman CL, et al. Impact of early initiation of intravenous therapy for acute decompensated heart failure on outcomes in ADHERE. *Cardiology*. 2007; 107: 44-51.