Review of the 2013 Heart Failure Guidelines: What You Need to Know (Part 2)

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Thank you for Joining the Webinar Today.

The Presentation will Begin Shortly.
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The full-text guidelines are also available on the following Web sites:
ACC (www.cardiosource.org) and AHA (my.americanheart.org)
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## Definition of Heart Failure

<table>
<thead>
<tr>
<th>Classification</th>
<th>Ejection Fraction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Heart Failure with Reduced Ejection Fraction (HF(_{r})EF)</td>
<td>≤40%</td>
<td>Also referred to as systolic HF. Randomized clinical trials have mainly enrolled patients with HF(_{r})EF and it is only in these patients that efficacious therapies have been demonstrated to date.</td>
</tr>
<tr>
<td>II. Heart Failure with Preserved Ejection Fraction (HF(_{p})EF)</td>
<td>≥50%</td>
<td>Also referred to as diastolic HF. Several different criteria have been used to further define HF(<em>{p})EF. The diagnosis of HF(</em>{p})EF is challenging because it is largely one of excluding other potential noncardiac causes of symptoms suggestive of HF. To date, efficacious therapies have not been identified.</td>
</tr>
<tr>
<td>a. HF(_{p})EF, Borderline</td>
<td>41% to 49%</td>
<td>These patients fall into a borderline or intermediate group. Their characteristics, treatment patterns, and outcomes appear similar to those of patient with HF(_{p})EF.</td>
</tr>
<tr>
<td>b. HF(_{p})EF, Improved</td>
<td>&gt;40%</td>
<td>It has been recognized that a subset of patients with HF(<em>{p})EF previously had HF(</em>{r})EF. These patients with improvement or recovery in EF may be clinically distinct from those with persistently preserved or reduced EF. Further research is needed to better characterize these patients.</td>
</tr>
</tbody>
</table>
## Classification of Heart Failure

<table>
<thead>
<tr>
<th>ACCF/AHA Stages of HF</th>
<th>NYHA Functional Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>None</td>
</tr>
<tr>
<td>At high risk for HF but without structural heart disease or symptoms of HF.</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>I</td>
</tr>
<tr>
<td>Structural heart disease but without signs or symptoms of HF.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>I</td>
</tr>
<tr>
<td>Structural heart disease with prior or current symptoms of HF.</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>IV</td>
</tr>
<tr>
<td>D</td>
<td>Refractory HF requiring specialized interventions.</td>
</tr>
</tbody>
</table>

*Helping Cardiovascular Professionals Learn, Advance, Heal.*

[American Heart Association Logo]
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. Although randomized trials are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

*Data available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as sex, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use.

† For comparative effectiveness recommendations (Class I and IIa, Level of Evidence A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.
Stages, Phenotypes and Treatment of HF

**At Risk for Heart Failure**

**STAGE A**  
At high risk for HF but without structural heart disease or symptoms of HF

- e.g., Patients with:
  - HTN
  - Atherosclerotic disease
  - DM
  - Obesity
  - Metabolic syndrome or
  - Patients
  - Using cardiotoxins
  - With family history of cardiomyopathy

**Therapy**
- Goals: Heart healthy lifestyle
  - Prevent vascular, coronary disease
  - Prevent LV structural abnormalities
- Drugs: ACEI or ARB in appropriate patients for vascular disease or DM
  - Statins as appropriate

**STAGE B**  
Structural heart disease but without signs or symptoms of HF

- e.g., Patients with:
  - Previous MI
  - LV remodeling including LVM and low EF
  - Asymptomatic valvular disease

**Therapy**
- Goals: Prevent HF symptoms
  - Prevent further cardiac remodeling
- Drugs: ACEI or ARB as appropriate
  - Beta blockers as appropriate
- In selected patients:
  - ICD
  - Revascularization or valvular surgery as appropriate

**STAGE C**  
Structural heart disease with prior or current symptoms of HF

- e.g., Patients with:
  - Known structural heart disease and
  - HF signs and symptoms

**Heart Failure**

**STAGE D**  
Refractory HF

- e.g., Patients with:
  - Marked HF symptoms at rest
  - Recurrent hospitalizations despite GDMT

**Therapy**
- Goals: Control symptoms
  - Improve HRQOL
  - Reduce hospital readmissions
  - Establish patient’s end-of-life goals
- Drugs for routine use:
  - Diuretics for fluid retention
  - ACEI or ARB
  - Beta blockers
  - Aldosterone antagonists
- Drugs for use in selected patients:
  - Hydralazine/isosorbide dinitrate
  - ACEI and ARB
  - Digoxin
- In selected patients:
  - CRT
  - ICD
  - Revascularization or valvular surgery as appropriate

American Heart Association
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Pharmacologic Treatment for Stage C HFrEF

HFrEF Stage C
NYHA Class I – IV
*Treatment:*

**Class I, LOE A**
ACEI or ARB **AND**
Beta Blocker

For all volume overload,
NYHA class II-IV patients

Add

Class I, LOE C
Loop Diuretics

For persistently symptomatic
African Americans,
NYHA class III-IV

Add

Class I, LOE A
Hydral-Nitrates

For NYHA class II-IV patients.
Provided estimated creatinine
>30 mL/min and K+ <5.0 mEq/dL

Add

Class I, LOE A
Aldosterone Antagonist

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## Drugs Commonly Used for HFrEF (Stage C HF)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Initial Daily Dose(s)</th>
<th>Maximum Doses(s)</th>
<th>Mean Doses Achieved in Clinical Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACE Inhibitors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Captopril</td>
<td>6.25 mg 3 times</td>
<td>50 mg 3 times</td>
<td>122.7 mg/d (421)</td>
</tr>
<tr>
<td>Enalapril</td>
<td>2.5 mg twice</td>
<td>10 to 20 mg twice</td>
<td>16.6 mg/d (412)</td>
</tr>
<tr>
<td>Fosinopril</td>
<td>5 to 10 mg once</td>
<td>40 mg once</td>
<td>---------</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>2.5 to 5 mg once</td>
<td>20 to 40 mg once</td>
<td>32.5 to 35.0 mg/d (444)</td>
</tr>
<tr>
<td>Perindopril</td>
<td>2 mg once</td>
<td>8 to 16 mg once</td>
<td>---------</td>
</tr>
<tr>
<td>Quinapril</td>
<td>5 mg twice</td>
<td>20 mg twice</td>
<td>---------</td>
</tr>
<tr>
<td>Ramipril</td>
<td>1.25 to 2.5 mg once</td>
<td>10 mg once</td>
<td>---------</td>
</tr>
<tr>
<td>Trandolapril</td>
<td>1 mg once</td>
<td>4 mg once</td>
<td>---------</td>
</tr>
<tr>
<td><strong>ARBs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candesartan</td>
<td>4 to 8 mg once</td>
<td>32 mg once</td>
<td>24 mg/d (419)</td>
</tr>
<tr>
<td>Losartan</td>
<td>25 to 50 mg once</td>
<td>50 to 150 mg once</td>
<td>129 mg/d (420)</td>
</tr>
<tr>
<td>Valsartan</td>
<td>20 to 40 mg twice</td>
<td>160 mg twice</td>
<td>254 mg/d (109)</td>
</tr>
<tr>
<td><strong>Aldosterone Antagonists</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spironolactone</td>
<td>12.5 to 25 mg once</td>
<td>25 mg once or twice</td>
<td>26 mg/d (424)</td>
</tr>
<tr>
<td>Eplerenone</td>
<td>25 mg once</td>
<td>50 mg once</td>
<td>42.6 mg/d (445)</td>
</tr>
</tbody>
</table>
## Drugs Commonly Used for HFrEF (Stage C HF) (cont.)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Initial Daily Dose(s)</th>
<th>Maximum Doses(s)</th>
<th>Mean Doses Achieved in Clinical Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta Blockers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bisoprolol</td>
<td>1.25 mg once</td>
<td>10 mg once</td>
<td>8.6 mg/d (118)</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125 mg twice</td>
<td>50 mg twice</td>
<td>37 mg/d (446)</td>
</tr>
<tr>
<td>Carvedilol CR</td>
<td>10 mg once</td>
<td>80 mg once</td>
<td>--------</td>
</tr>
<tr>
<td>Metoprolol succinate extended release (metoprolol CR/XL)</td>
<td>12.5 to 25 mg once</td>
<td>200 mg once</td>
<td>159 mg/d (447)</td>
</tr>
<tr>
<td><strong>Hydralazine &amp; Isosorbide Dinitrate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed dose combination (423)</td>
<td>37.5 mg hydralazine/20 mg isosorbide dinitrate 3 times daily</td>
<td>75 mg hydralazine/40 mg isosorbide dinitrate 3 times daily</td>
<td>~175 mg hydralazine/90 mg isosorbide dinitrate daily</td>
</tr>
<tr>
<td>Hydralazine and isosorbide dinitrate (448)</td>
<td>Hydralazine: 25 to 50 mg, 3 or 4 times daily and isosorbide dinitrate: 20 to 30 mg 3 or 4 times daily</td>
<td>Hydralazine: 300 mg daily in divided doses and isosorbide dinitrate 120 mg daily in divided doses</td>
<td>--------</td>
</tr>
</tbody>
</table>
Indications for CRT Therapy

Patient with cardiomyopathy on GDMT for ≥3 mo or on GDMT and ≥40 d after MI, or with implantation of pacing or defibrillation device for special indications

LVEF ≤35%

Evaluate general health status

Comorbidities and/or frailty limit survival with good functional capacity to <1 y

Continue GDMT without implanted device

Acceptable noncardiac health

Evaluate NYHA clinical status

NYHA class I
- LVEF ≤30%
- QRS ≥150 ms
- LBBB pattern
- Ischemic cardiomyopathy
- QRS ≤150 ms
- Non-LBBB pattern

NYHA class II
- LVEF ≤35%
- QRS ≥150 ms
- LBBB pattern
- Sinus rhythm
- LVEF ≤35%
- QRS 120-149 ms
- LBBB pattern
- Sinus rhythm
- LVEF ≤35%
- QRS ≥150 ms
- Non-LBBB pattern
- Sinus rhythm
- QRS ≤150 ms
- Non-LBBB pattern

NYHA class III & Ambulatory class IV
- LVEF ≤35%
- QRS ≥150 ms
- LBBB pattern
- Sinus rhythm
- LVEF ≤35%
- QRS 120-149 ms
- LBBB pattern
- Sinus rhythm
- LVEF ≤35%
- QRS ≥150 ms
- Non-LBBB pattern
- Sinus rhythm
- LVEF ≤35%
- QRS 120-149 ms
- Non-LBBB pattern
- Sinus rhythm

Special CRT Indications
- Anticipated to require frequent ventricular pacing (>40%)
- atrial fibrillation, if ventricular pacing is required and rate control will result in near 100% ventricular pacing with CRT

Colors correspond to the class of recommendations in the ACC/AHA Table 1.

Benefit for NYHA class I and II patients has only been shown in CRT-D trials, and while patients may not experience immediate symptomatic benefit, late remodeling may be avoided along with long-term HF consequences. There are no trials that support CRT-pacing (without ICD) in NYHA class I and II patients. Thus, it is anticipated these patients would receive CRT-D unless clinical reasons or personal wishes make CRT-pacing more appropriate. In patients who are NYHA class III and ambulatory class IV, CRT-D may be chosen but clinical reasons and personal wishes may make CRT-pacing appropriate to improve symptoms and quality of life when an ICD is not expected to produce meaningful benefit in survival.
Treatment of Stages A to D

Stage D
## Clinical Events and Findings Useful for Identifying Patients With Advanced HF

<table>
<thead>
<tr>
<th>Event/finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeated (≥2) hospitalizations or ED visits for HF in the past year</td>
</tr>
<tr>
<td>Progressive deterioration in renal function (e.g., rise in BUN and creatinine)</td>
</tr>
<tr>
<td>Weight loss without other cause (e.g., cardiac cachexia)</td>
</tr>
<tr>
<td>Intolerance to ACE inhibitors due to hypotension and/or worsening renal function</td>
</tr>
<tr>
<td>Intolerance to beta blockers due to worsening HF or hypotension</td>
</tr>
<tr>
<td>Frequent systolic blood pressure &lt;90 mm Hg</td>
</tr>
<tr>
<td>Persistent dyspnea with dressing or bathing requiring rest</td>
</tr>
<tr>
<td>Inability to walk 1 block on the level ground due to dyspnea or fatigue</td>
</tr>
<tr>
<td>Recent need to escalate diuretics to maintain volume status, often reaching daily furosemide equivalent dose &gt;160 mg/d and/or use of supplemental metolazone therapy</td>
</tr>
<tr>
<td>Progressive decline in serum sodium, usually to &lt;133 mEq/L</td>
</tr>
<tr>
<td>Frequent ICD shocks</td>
</tr>
</tbody>
</table>

Adapted from Russell et al. (640).
Water Restriction
Water Restriction

Fluid restriction (1.5 to 2 L/d) is reasonable in stage D, especially in patients with hyponatremia, to reduce congestive symptoms.
Inotropic Support
Inotropic Support

Until definitive therapy (e.g., coronary revascularization, MCS, heart transplantation) or resolution of the acute precipitating problem, patients with cardiogenic shock should receive temporary intravenous inotropic support to maintain systemic perfusion and preserve end-organ performance.

Continuous intravenous inotropic support is reasonable as “bridge therapy” in patients with stage D refractory to GDMT and device therapy who are eligible for and awaiting MCS or cardiac transplantation.
Inotropic Support (cont.)

Short-term, continuous intravenous inotropic support may be reasonable in those hospitalized patients presenting with documented severe systolic dysfunction who present with low blood pressure and significantly depressed cardiac output to maintain systemic perfusion and preserve end-organ performance.

Long-term, continuous intravenous inotropic support may be considered as palliative therapy for symptom control in select patients with stage D despite optimal GDMT and device therapy who are not eligible for either MCS or cardiac transplantation.
Inotropic Support (cont.)

Long-term use of either continuous or intermittent, intravenous parenteral positive inotropic agents, in the absence of specific indications or for reasons other than palliative care, is potentially harmful in the patient with HF.

Use of parenteral inotropic agents in hospitalized patients without documented severe systolic dysfunction, low blood pressure, or impaired perfusion, and evidence of significantly depressed cardiac output, with or without congestion, is potentially harmful.
Treatment of Stages A to D

Mechanical Circulatory Support
Mechanical Circulatory Support

MCS use is beneficial in carefully selected* patients with stage D HFrEF in whom definitive management (e.g., cardiac transplantation) or cardiac recovery is anticipated or planned.

Nondurable MCS, including the use of percutaneous and extracorporeal ventricular assist devices (VADs), is reasonable as a “bridge to recovery” or a “bridge to decision” for carefully selected* patients with HFrEF with acute, profound hemodynamic compromise.

Durable MCS is reasonable to prolong survival for carefully selected* patients with stage D HFrEF.
Cardiac Transplantation
Cardiac Transplantation

Evaluation for cardiac transplantation is indicated for carefully selected patients with stage D HF despite GDMT, device, and surgical management.
The Hospitalized Patient
## Classification of Hospitalized HF

<table>
<thead>
<tr>
<th></th>
<th>Congestion at rest?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(e.g. orthopnea, elevated jugular venous pressure, pulmonary rales, S3 gallop, edema)</td>
</tr>
<tr>
<td>Low perfusion at rest?</td>
<td>No</td>
</tr>
<tr>
<td>(e.g. narrow pulse pressure, cool extremities, hypotension)</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Adapted with permission from Nohria, et al. (714).
The Hospitalized Patient

Precipitating Causes of Decompensated HF
Precipitating Causes of Decompensated HF

ACS precipitating acute HF decompensation should be promptly identified by ECG and serum biomarkers including cardiac troponin testing, and treated optimally as appropriate to the overall condition and prognosis of the patient.

Common precipitating factors for acute HF should be considered during initial evaluation, as recognition of these conditions is critical to guide appropriate therapy.
Maintenance of GDMT During Hospitalization
In patients with HFrEF experiencing a symptomatic exacerbation of HF requiring hospitalization during chronic maintenance treatment with GDMT, it is recommended that GDMT be continued in the absence of hemodynamic instability or contraindications.

Initiation of beta-blocker therapy is recommended after optimization of volume status and successful discontinuation of intravenous diuretics, vasodilators, and inotropic agents. Beta-blocker therapy should be initiated at a low dose and only in stable patients. Caution should be used when initiating beta blockers in patients who have required inotropes during their hospital course.
Diuretics in Hospitalized Patients
Diuretics in Hospitalized Patients

Patients with HF admitted with evidence of significant fluid overload should be promptly treated with intravenous loop diuretics to reduce morbidity.

If patients are already receiving loop diuretic therapy, the initial intravenous dose should equal or exceed their chronic oral daily dose and should be given as either intermittent boluses or continuous infusion. Urine output and signs and symptoms of congestion should be serially assessed, and the diuretic dose should be adjusted accordingly to relieve symptoms, reduce volume excess, and avoid hypotension.
Diuretics in Hospitalized Patients (cont.)

The effect of HF treatment should be monitored with careful measurement of fluid intake and output, vital signs, body weight that is determined at the same time each day, and clinical signs and symptoms of systemic perfusion and congestion. Daily serum electrolytes, urea nitrogen, and creatinine concentrations should be measured during the use of intravenous diuretics or active titration of HF medications.

When diuresis is inadequate to relieve symptoms, it is reasonable to intensify the diuretic regimen using either:
   a. higher doses of intravenous loop diuretics.
   b. addition of a second (e.g., thiazide) diuretic.
Diuretics in Hospitalized Patients (cont.)

Low-dose dopamine infusion may be considered in addition to loop diuretic therapy to improve diuresis and better preserve renal function and renal blood flow.
The Hospitalized Patient

Renal Replacement Therapy
Renal Replacement Therapy

Ultrafiltration may be considered for patients with obvious volume overload to alleviate congestive symptoms and fluid weight.

Ultrafiltration may be considered for patients with refractory congestion not responding to medical therapy.
The Hospitalized Patient

Parenteral Therapy in Hospitalized HF
Parenteral Therapy in Hospitalized HF

If symptomatic hypotension is absent, intravenous nitroglycerin, nitroprusside or nesiritide may be considered an adjuvant to diuretic therapy for relief of dyspnea in patients admitted with acutely decompensated HF.
The Hospitalized Patient

Venous Thromboembolism Prophylaxis in Hospitalized Patients
Venous Thromboembolism Prophylaxis in Hospitalized Patients

A patient admitted to the hospital with decompensated HF should be treated for venous thromboembolism prophylaxis with an anticoagulant medication if the risk:benefit ratio is favorable.
Arginine Vasopressin Antagonists
Arginine Vasopressin Antagonists

In patients hospitalized with volume overload, including HF, who have persistent severe hyponatremia and are at risk for or having active cognitive symptoms despite water restriction and maximization of GDMT, vasopressin antagonists may be considered in the short term to improve serum sodium concentration in hypervolemic, hyponatremic states with either a V2 receptor selective or a nonselective vasopressin antagonist.
Arginine Vasopressin Antagonists

• Risk of liver injury has been described in those with pre-existing liver disease when exposed to AVP antagonists

Surgical/Percutaneous/Transcatheter Interventional Treatments of HF

Guideline for HF
Coronary artery revascularization via CABG or percutaneous intervention is indicated for patients (HFpEF and HFrEF) on GDMT with angina and suitable coronary anatomy, especially for a left main stenosis (>50%) or left main equivalent disease.

CABG to improve survival is reasonable in patients with mild to moderate LV systolic dysfunction (EF 35% to 50%) and significant (≥70% diameter stenosis) multivessel CAD or proximal LAD coronary artery stenosis when viable myocardium is present in the region of intended revascularization.
CABG or medical therapy is reasonable to improve morbidity and cardiovascular mortality for patients with severe LV dysfunction (EF <35%), HF, and significant CAD.

Surgical aortic valve replacement is reasonable for patients with critical aortic stenosis and a predicted surgical mortality of no greater than 10%.

Transcatheter aortic valve replacement after careful candidate consideration is reasonable for patients with critical aortic stenosis who are deemed inoperable.
Surgical/Percutaneous/Transcatheter Interventional Treatment of HF (cont.)

CABG may be considered with the intent of improving survival in patients with ischemic heart disease with severe LV systolic dysfunction (EF <35%), and operable coronary anatomy whether or not viable myocardium is present.

Transcatheter mitral valve repair or mitral valve surgery for functional mitral insufficiency is of uncertain benefit and should only be considered after careful candidate selection and with a background of GDMT.

Surgical reverse remodeling or LV aneurysmectomy may be considered in carefully selected patients with HFrEF for specific indications including intractable HF and ventricular arrhythmias.
**Surgical/Percutaneous/Transcatheter Interventional Treatment of HF**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG or percutaneous intervention is indicated for HF patients on GDMT with angina and suitable coronary anatomy especially, significant left main stenosis or left main equivalent disease</td>
<td>I</td>
<td>C</td>
</tr>
<tr>
<td>CABG to improve survival is reasonable in patients with mild to moderate LV systolic dysfunction and significant multivessel CAD or proximal LAD stenosis when viable myocardium is present</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>CABG or medical therapy is reasonable to improve morbidity and mortality for patients with severe LV dysfunction (EF &lt;35%), HF and significant CAD</td>
<td>IIa</td>
<td>B</td>
</tr>
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<td>Surgical aortic valve replacement is reasonable for patients with critical aortic stenosis and a predicted surgical mortality of no greater than 10%</td>
<td>IIa</td>
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<td>Transcatheter aortic valve replacement is reasonable for patients with critical aortic stenosis who are deemed inoperable</td>
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<td>CABG may be considered in patients with ischemic heart disease, severe LV systolic dysfunction and suitable coronary anatomy whether or not viable myocardium is present</td>
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<td>IIb</td>
<td>B</td>
</tr>
</tbody>
</table>
The Hospitalized Patient

Inpatient and Transitions of Care
Inpatient and Transitions of Care

The use of performance improvement systems and/or evidence-based systems of care is recommended in the hospital and early postdischarge outpatient setting to identify appropriate HF patients for GDMT, provide clinicians with useful reminders to advance GDMT, and to assess the clinical response.
Inpatient and Transitions of Care

Throughout the hospitalization as appropriate, before hospital discharge, at the first postdischarge visit, and in subsequent follow-up visits, the following should be addressed:

a. initiation of GDMT if not previously established and not contraindicated;
b. precipitant causes of HF, barriers to optimal care transitions, and limitations in postdischarge support;
c. assessment of volume status and supine/upright hypotension with adjustment of HF therapy, as appropriate;
d. titration and optimization of chronic oral HF therapy;
e. assessment of renal function and electrolytes, where appropriate;
f. assessment and management of comorbid conditions;
g. reinforcement of HF education, self-care, emergency plans, and need for adherence; and
h. consideration for palliative care or hospice care in selected patients.
Inpatient and Transitions of Care

Multidisciplinary HF disease-management programs are recommended for patients at high risk for hospital readmission, to facilitate the implementation of GDMT, to address different barriers to behavioral change, and to reduce the risk of subsequent rehospitalization for HF.

Scheduling an early follow-up visit (within 7 to 14 days) and early telephone follow-up (within 3 days) of hospital discharge is reasonable.

Use of clinical risk prediction tools and/or biomarkers to identify patients at higher risk for postdischarge clinical events is reasonable.
## Therapies in the Hospitalized HF Patient

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF patients hospitalized with fluid overload should be treated with intravenous diuretics</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>HF patients receiving loop diuretic therapy, should receive an initial parenteral dose greater than or equal to their chronic oral daily dose, then should be serially adjusted</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>HFrEF patients requiring HF hospitalization on GDMT should continue GDMT unless hemodynamic instability or contraindications</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Initiation of beta-blocker therapy at a low dose is recommended after optimization of volume status and discontinuation of intravenous agents</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Thrombosis/thromboembolism prophylaxis is recommended for patients hospitalized with HF</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>Serum electrolytes, urea nitrogen, and creatinine should be measured during the titration of HF medications, including diuretics</td>
<td>I</td>
<td>C</td>
</tr>
</tbody>
</table>
## Therapies in the Hospitalized HF Patient (cont.)

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>When diuresis is inadequate, it is reasonable to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Give higher doses of intravenous loop diuretics; or</td>
<td>IIA</td>
<td>B</td>
</tr>
<tr>
<td>b) add a second diuretic (e.g., thiazide)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-dose dopamine infusion may be considered with loop diuretics to</td>
<td>IIB</td>
<td>B</td>
</tr>
<tr>
<td>improve diuresis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ultrafiltration may be considered for patients with obvious volume overload</td>
<td>IIB</td>
<td>B</td>
</tr>
<tr>
<td>Ultrafiltration may be considered for patients with refractory congestion</td>
<td>IIB</td>
<td>C</td>
</tr>
<tr>
<td>Intravenous nitroglycerin, nitroprusside or nesiritide may be considered an</td>
<td>IIB</td>
<td>B</td>
</tr>
<tr>
<td>adjuvant to diuretic therapy for stable patients with HF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In patients hospitalized with volume overload and severe hyponatremia,</td>
<td>IIB</td>
<td>B</td>
</tr>
<tr>
<td>vasopressin antagonists may be considered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Hospital Discharge

<table>
<thead>
<tr>
<th>Recommendation or Indication</th>
<th>COR</th>
<th>LOE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance improvement systems in the hospital and early postdischarge outpatient setting to identify HF for GDMT</td>
<td>I</td>
<td>B</td>
</tr>
</tbody>
</table>
| Before hospital discharge, at the first postdischarge visit, and in subsequent follow-up visits, the following should be addressed:  
  a) initiation of GDMT if not done or contraindicated;  
  b) causes of HF, barriers to care, and limitations in support;  
  c) assessment of volume status and blood pressure with adjustment of HF therapy;  
  d) optimization of chronic oral HF therapy;  
  e) renal function and electrolytes;  
  f) management of comorbid conditions;  
  g) HF education, self-care, emergency plans, and adherence; and  
  h) palliative or hospice care. | I   | B   |
| Multidisciplinary HF disease-management programs for patients at high risk for hospital readmission are recommended | I   | B   |
| A follow-up visit within 7 to 14 days and/or a telephone follow-up within 3 days of hospital discharge is reasonable | IIa | B   |
| Use of clinical risk-prediction tools and/or biomarkers to identify higher-risk patients is reasonable | IIa | B   |
Coordinating Care for Patients With Chronic HF
Coordinating Care for Patients With Chronic HF

**Effective systems of care coordination with special attention to care transitions should be deployed for every patient with chronic HF that facilitate and ensure effective care that is designed to achieve GDMT and prevent hospitalization.**

Every patient with HF should have a clear, detailed and evidence-based plan of care that ensures the achievement of GDMT goals, effective management of comorbid conditions, timely follow-up with the healthcare team, appropriate dietary and physical activities, and compliance with Secondary Prevention Guidelines for cardiovascular disease. This plan of care should be updated regularly and made readily available to all members of each patient’s healthcare team.

**Palliative and supportive care is effective for patients with symptomatic advanced HF to improve quality of life.**
Guideline for HF

Quality Metrics/Performance Measures
Quality Metrics/Performance Measures

Performance measures based on professionally developed clinical practice guidelines should be used with the goal of improving quality of care for HF.

Participation in quality improvement programs and patient registries based on nationally endorsed, clinical practice guideline-based quality and performance measures may be beneficial in improving quality of HF care.
### ACCF/AHA/AMA-PCPI 2011 HF Performance Measurement Set

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description*</th>
<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LVEF assessment</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF for whom the quantitative or qualitative results of a recent or prior (any time in the past) LVEF assessment is documented within a 12 mo period</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
</tbody>
</table>
| 2. LVEF assessment                   | Percentage of patients aged ≥18 y with a principal discharge diagnosis of HF with documentation in the hospital record of the results of an LVEF assessment that was performed either before arrival or during hospitalization, OR documentation in the hospital record that LVEF assessment is planned for after discharge | Inpatient | • Individual practitioner  
• Facility |
| 3. Symptom and activity assessment   | Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF with quantitative results of an evaluation of both current level of activity and clinical symptoms documented | Outpatient | Individual practitioner |

*Please refer to the complete measures for comprehensive information, including measure exception.

Adapted from Bonow et al. (918).
### ACCF/AHA/AMA-PCPI 2011 HF Performance Measurement Set (cont.)

<table>
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<tr>
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<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Symptom management†</td>
<td>Percentage of patient visits for those patients aged ≥18 y with a diagnosis of HF and with quantitative results of an evaluation of both level of activity AND clinical symptoms documented in which patient symptoms have improved or remained consistent with treatment goals since last assessment OR patient symptoms have demonstrated clinically important deterioration since last assessment with a documented plan of care</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>5. Patient self-care education†‡</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF who were provided with self-care education on ≥3 elements of education during ≥1 visits within a 12 mo period</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>6. Beta-blocker therapy for LVSD (outpatient and inpatient setting)</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF &lt;40% who were prescribed beta-blocker therapy with bisoprolol, carvedilol, or sustained release metoprolol succinate either within a 12 mo period when seen in the outpatient setting or at hospital discharge</td>
<td>Inpatient and Outpatient</td>
<td>Individual practitioner Facility</td>
</tr>
</tbody>
</table>

*Please refer to the complete measures for comprehensive information, including measure exception.
†Test measure designated for use in internal quality improvement programs only. These measures are not appropriate for any other purpose, e.g., pay for performance, physician ranking or public reporting programs.
‡New measure.

Adapted from Bonow et al. (918).
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<th>Care Setting</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. ACE Inhibitor or ARB Therapy for LVSD (outpatient and inpatient setting)</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with a current or prior LVEF &lt;40% who were prescribed ACE inhibitor or ARB therapy either within a 12 mo period when seen in the outpatient setting or at hospital discharge</td>
<td>Inpatient and Outpatient</td>
<td>Individual practitioner Facility</td>
</tr>
<tr>
<td>8. Counseling regarding ICD implantation for patients with LVSD on combination medical therapy†‡</td>
<td>Percentage of patients aged ≥18 y with a diagnosis of HF with current LVEF ≤35% despite ACE inhibitor/ARB and beta-blocker therapy for at least 3 mo who were counseled regarding ICD implantation as a treatment option for the prophylaxis of sudden death</td>
<td>Outpatient</td>
<td>Individual practitioner</td>
</tr>
<tr>
<td>9. Post-discharge appointment for heart failure patients</td>
<td>Percentage of patients, regardless of age, discharged from an inpatient facility to ambulatory care or home health care with a principal discharge diagnosis of HF for whom a follow-up appointment was scheduled and documented including location, date and time for a follow-up office visit, or home health visit (as specified)</td>
<td>Inpatient</td>
<td>Facility</td>
</tr>
</tbody>
</table>

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‡New measure.

Adapted from Bonow et al. (918).
Conclusions

• Evidence-based guideline directed diagnosis, evaluation and therapy should be the mainstay for all patients with HF.

• Effective implementation of guideline-directed best quality care reduces mortality, improves QOL and preserves health care resources.

• Ongoing research is needed to answer the remaining questions including: prevention, nonpharmacological therapy of HF including dietary adjustments, treatment of HFpEF, management of hospitalized HF, effective reduction in HF readmissions, more precise use of device-based therapy, smaller MCS platforms and cell-based regenerative therapy.
Thank You!

- For more information and to register for Target: HF®, go to www.heart.org/targethf.
  - In order to claim your continuing education credits for attending this Target: Heart Failure webinar please download the document entitled “Instructions for Claiming CME/CE Credits” or download the instructions from www.heart.org/targethf click on icon that says “webinars/slide decks”. Find this event and download the document.
  - Please follow the instructions listed in this document.
  - Remember to visit learn.heart.org
  - This is also a great site that the American Heart Association provides where you can Learn at Heart with the latest Cardiovascular and Stroke CME/CE activities