



Clinical Care Guidelines for: Congestive Heart Failure (CHF)

OBJECTIVE

Guide the appropriate diagnosis and management of Congestive Heart Failure in adults. MDwise measurements include: **(1)** Emergency room visits due to CHF **(2)** Inpatient admissions due to CHF

GUIDELINE

MDwise supports the clinical performance measures of the American College of Cardiology Foundation, American Heart Association on Practice Guidelines, and the International Society for Heart and Lung Transplantation; [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](#)
The Guidelines support the New York Heart Association (NYHA) function classification which gauges the severity of symptoms in persons with CHF; New York Heart Association (NYHA)

Guidelines are included in the MDwise Provider Manual and posted on the MDwise Web site. They are available individually as requested.

DIAGNOSIS

FOUR STAGES OF HF

Rationale of staging: introducing therapy early-on, before appearance of LV dysfunction or symptoms may reduce morbidity and mortality

Stage A: **(1)** risk factors for development of HF but no impaired LV function, hypertrophy, or geometric chamber distortion i.e. coronary artery disease, hypertension, or diabetes mellitus

Stage B: **(1)** risk factors for development of HF but asymptomatic with LV hypertrophy and/or impaired LV function

Stage C: **(1)** current or past symptoms of HF due to structural heart disease **(2)** majority of patients with HF in this category

Stage D: **(1)** refractory HF **(2)** consider mechanical circulatory support, fluid removal procedures, continuous inotropic infusions, heart transplant, other surgical procedures, or palliative care

CLINICAL DIAGNOSIS BASED ON HISTORY AND PHYSICAL EXAMINATION

1. History of medication use, alcohol use, illicit drug use, tobacco use, hypertension, diabetes mellitus, dyslipidemia, coronary, valvular, or peripheral vascular disease, rheumatic fever, heart murmur or congenital heart disease, personal or family history of myopathy, mediastinal irradiation; sleep-disturbed breathing, and exposure to cardiotoxic agents
2. Physical examination should document signs of right/left HF and if presence of elevated jugular venous pressure and 3rd heart sound
3. Symptoms: **(1)** dyspnea and/or fatigue with or w/o decreased exercise tolerance **(2)** ask patients to describe activities that they would prefer to engage in but cannot because changes in the ability to perform certain activities is related to important changes in clinical status or course
4. Signs: **(1)** edema **(2)** rales **(3)** orthostatic blood pressure changes

LAB EVALUATION: complete blood count, urinalysis, serum electrolytes (including calcium and magnesium), blood urea nitrogen, serum creatinine, fasting blood glucose (glycohemoglobin), lipid profile, liver function tests, and thyroid-stimulating hormone, chest radiograph, 12-lead electrocardiogram, measurement of natriuretic peptides (BNP and NT-proBNP) has role in urgent care setting in patients where uncertain clinical diagnosis

3 NECESSARY QUESTIONS: **(1)** Preserved LVEF or reduced? **(2)** Normal or abnormal LV structure? **(3)** Other structural abnormalities causing presentation?

DEGREE OF FUNCTIONAL LIMITATION

Class	Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause excessive fatigue, palpitation, or dyspnea (shortness of breath).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea.
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnea.
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of cardiac insufficiency at rest. If any physical activity is undertaken, discomfort is increased.

TREATMENT

Focused on patients with reduced LVEF and Stage C HF. Few clinical trials available for management of patients with preserved LVEF but therapy similar.

Drug Class	Place In Therapy	Precautions and Monitoring Mentioned in Guidelines
Loop Diuretics (1) furosemide (2) torsemide Thiazide Diuretics (1) hydrochlorothiazide (2) metolazone	<ul style="list-style-type: none"> -Current or prior symptoms of HF and reduced LVEF with evidence of fluid retention -Maintain sodium balance and prevent edema -Even once fluid retention has resolved, the diuretic should be continued to prevent further volume overload -Loops preferred in most HF cases: taken until euvolemic state reached and continued to prevent further fluid retention -Produce symptomatic relief faster than any other agent indicated for HF -Thiazides: if hypertensive with mild fluid retention 	<ul style="list-style-type: none"> -Dose of the diuretic may need adjustment, so have the patient record their daily weight to guide diuretic dosing decisions -Become less effective as HF progresses, at high dietary intake of sodium, and conflicting drugs like NSAIDs and COX-2 inhibitors -Diuretic resistance may be overcome by administering them IV, combining two or more diuretics, or using diuretics with positive inotropic agents -Long-term supplementation of potassium due to loop diuretic use often not necessary when taking concomitantly with ACEIs or aldosterone antagonists (spironolactone) and may be dangerous -Excessive use of diuretics can cause renal impairment, decrease in exercise tolerance, and decrease in blood pressure
Hydralazine and Isosorbide Dinitrate	<ul style="list-style-type: none"> -Improve outcomes for African-Americans, with moderate-severe symptoms on optimal therapy with ACEIs, BBs, and diuretics -For those with persistent congestive symptoms -Combined to achieve arterial and venous vasodilation 	<ul style="list-style-type: none"> -SE: headaches, hypotension, GI intolerance -Do not use if no prior use of ACEI -May use if ACEI-intolerant
ACEIs Studied in clinical trials in HF or post-MI patients at doses proven to be disease-modifying: (1) captopril (2) enalapril (3) lisinopril (4) perindopril (5) ramipril (6)trandolapril	<ul style="list-style-type: none"> -All patients with: (1) HF due to LV systolic dysfunction (2) with reduced LVEF -Use ARB if ACEI-intolerant (valsartan, candesartan). -Decrease symptoms, hospitalizations, risk of death, improve clinical status, and enhance overall well-being -Greater evidence of effectiveness than ARBs Add BB before full target dose reached -Initiate at low doses and increase as tolerated -Use doses that have been shown to decrease risk of cardiovascular events in clinical trials unless not tolerated 	<ul style="list-style-type: none"> -If angioedema with ACEI, avoid ACEI -Abrupt withdrawal should be avoided (other than angioedema) due to clinical deterioration -Contraindicated if history of angioedema -Pregnancy category X -Assess renal function and serum potassium within at least two weeks of initiation of therapy and periodically thereafter -SE: hypotension, dizziness
ARBs	<ul style="list-style-type: none"> -Reasonable alternatives to ACEI -If develop angioedema with ACEI, may also develop with ARB -Add BB before full target dose reached -Not recommended to use <u>with</u> ACEI 	<ul style="list-style-type: none"> - Extreme caution if ARB used with history of angioedema to ACE because of potential for similar reaction to ARB -See ACEI
Aldosterone Antagonists	<ul style="list-style-type: none"> -Low doses added to ACEI with NYHA class IV or III symptoms reduced risk of death in clinical trial -Moderately severe to severe symptoms of HF and reduced LVEF -Avoid triple combination of ACEI + ARB + aldosterone antagonist -Recommended to d/c or lower dose of potassium supplements if initiate -Potassium levels $\geq 5.5\text{mEq/L}$ may require d/c or dose reduction of aldosterone antagonist 	<ul style="list-style-type: none"> -Renally adjust -Can cause marked fluid depletion when added to diuretic therapy, increasing chance for renal dysfunction and hyperkalemia -Gynecomastia more common with spironolactone than with eplerenone -Potassium levels and renal function should be evaluated within 3 days of initiation, and again after 7 days of therapy -Continue monitoring as needed, at least monthly x three months, to every three months thereafter
Beta Blockers (1) bisoprolol (2) SR metoprolol succinate (3) carvedilol	<ul style="list-style-type: none"> -Stable with current or prior symptoms of HF and reduced LVEF -Used to prevent adverse effects of sympathetic nervous system -Long-term continuation to decrease symptoms of HF, improve clinical status, and enhance overall well-being -Reduced death risk, reduced risk of hospitalization -Target doses should be achieved unless not tolerated -Ensure not volume overloaded before initiated because can cause fluid retention 	<ul style="list-style-type: none"> -Clinical response may take at least two months -Do not d/c after worsening HF, even if develop fluid retention and must increase dose of diuretic -D/c or decrease dose if hypoperfusion or requirement of IV positive inotropes until condition stabilizes -If hypotension with clinical evidence of hypoperfusion decrease dose of d/c -SE: general fatigue, weakness that may resolve in several weeks
Digoxin	<ul style="list-style-type: none"> -Current or prior symptoms of HF and reduced LVEF to decrease hospitalizations for HF -Reduces symptoms and hospitalizations, controls rhythm, and enhances exercise tolerance -No loading doses 	<ul style="list-style-type: none"> -May add if persistent symptoms of HF while on diuretic, ACEI/ARB, and BB or if severe symptoms and have not responded symptomatically with initial triple regimen -If remain symptomatic, instead of adding digoxin, may add aldosterone antagonist unless unresponsive to aldosterone antagonist or not tolerated

REFERENCES

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

MDwise Medical Advisory Council – Approval Date: 06/09/10;12/14/11