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Clinical Practice Guidelines
Heart Failure (HF)

Objective

The purpose is to guide the appropriate diagnosis and management of Heart Failure. MDwise measurements include: Emergency room visits due to Congestive Heart Failure (CHF); Inpatient admissions due to CHF.

Guideline

These are only guidelines, and are based on the best available information at the time of research. These may not be "all inclusive" as new medications and treatments are ever-evolving. These guidelines are updated by MDwise at least biannually as national guidelines are updated.

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;
2017 American College of Cardiology/American Heart Association/Heart Failure Society of America (ACC/AHA/HFSA) Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure (HF):

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

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 presence of elevated jugular venous pressure or 3rd heart sound, if applicable
3. Symptoms: dyspnea and/or fatigue at rest or upon exertion; cough; ask patients to describe activities that they would like to engage in but cannot because inability to perform certain activities is related to important changes in clinical status or course
4. Signs: edema; rales; orthostatic blood pressure changes

LAB EVALATION

B-type natriuretic peptide (BNP) and N-terminal pro B-type natriuretic peptide (NT-proBNP) are both natriuretic peptide biomarkers used to distinguish between cardiac and non-cardiac causes of dyspnea. Cardiac troponin levels may also be elevated in the setting of chronic or acute decompensated HF, indicating myocyte injury or necrosis. An echocardiogram is considered the "gold standard" for assessment of LV systolic dysfunction, and is used to measure left ventricular ejection fraction (LVEF).

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Clinical Work-Up

Ejection Fraction Ranges

EF	Condition	Presentation
50-70%	Normal	Normal
≥ 50%	Heart Failure with Preserved Ejection Fraction (HFpEF)	Impaired ventricular relaxation and filling during diastole
40-49%	Heart Failure with Mid-Range Ejection Fraction (HFmrEF)	Likely mixed systolic and diastolic dysfunction
< 40%	Heart Failure with Reduced Ejection Fraction (HFrEF)	Impaired ability to eject blood during systole

Comparison of ACCF/AHA Stages of HF and NYHA Functional Classifications

ACCF/AHA Stages of HF		NYHA Functional Classifications	
A	At high risk for HF but without structural heart disease or symptoms of HF	None	
B	Structural heart disease but without signs or symptoms of HF	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
Clinical Diagnosis of HF			
C	Structural heart disease with prior or current symptoms of HF	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
		II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
		III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
D	Refractory HF requiring specialized interventions	IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.

ACCF indicates American College of Cardiology Foundation; AHA, American Heart Association; HF, heart failure; and NYHA, New York Heart Association.

Treatment

The primary focus of treatment is on patients with HFrEF and Stage C/D disease.

Few clinical trials are available for management of patients with HFpEF; treatment of HFpEF focuses on management of underlying comorbidities.

Drug Class	Place in Therapy	Precautions and Monitoring
Decreases Mortality		
Angiotensin Converting Enzyme Inhibitors (ACEIs®) • Lisinopril (Prinivil®, Zestril®) • Enalapril (Vasotec®, Epaned®) • Captopril (Capoten®) • Ramipril (Altace®) • Quinapril (Accupril®)	• First-line: indicated for all HF patients (NYHA Class I-IV) regardless of symptoms	• If angioedema with ACEI, avoid ACEI • Abrupt withdrawal should be avoided (other than angioedema) due to clinical deterioration • Contraindicated if history of angioedema • D/C as soon as pregnancy is detected • Assess renal function and serum potassium within at least two weeks of initiation of therapy and periodically thereafter • SE: hypotension, dizziness, hyperkalemia

Drug Class	Place in Therapy	Precautions and Monitoring
Angiotensin Receptor Blockers (ARBs) • Candesartan (Atacand®) • Losartan (Cozaar®) • Valsartan (Diovan®)	• First-line: Use if intolerant to ACEI • Do not use in combination with ACEI	• Extreme caution if ARB used with history of angioedema to ACEI • See ACEI for additional information
Beta Blockers (BBs) • Bisoprolol (Zebeta®) • Metoprolol succinate (Toprol XL®) • Carvedilol (Coreg®)	• First-line: indicated for all HF patients (NYHA Class I-IV) regardless of symptoms • Benefits not proven to be a class effect. Only the three agents listed demonstrate benefit in clinical trials	• 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 • If hypotension with clinical evidence of hypo perfusion decrease dosage or d/c • Gradually taper upon d/c (over 1-2 weeks) to avoid tachycardia, HTN, and/or ischemia • SE: general fatigue, weakness that may resolve in several weeks
Aldosterone Receptor Antagonists • Spironolactone (Aldactone®) • Eplerenone (Inspra®)	• Indicated for HF patients with NYHA Class II-IV if CrCl > 30 mL/min and K+ < 5.0 mEq/L	• 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 for three months, to every three months thereafter
Decrease Mortality in Select Patients		
Hydralazine and Isosorbide Dinitrate (BiDil®)	• Indicated for NYHA class III-IV in black patients	• SE: headaches, hypotension, GI intolerance • Do not use if no prior use of ACEI May use if ACEI-intolerant
Not proven to reduce mortality, but may improve symptoms and reduce hospitalization		
Loop Diuretics • Furosemide (Lasix®) • Torsemide (Demadex®) • Bumetanide (Bumex®)	• First-line on an as-needed basis for all patients with HFrEF NYHA class I-IV	• Closely monitor patient weight to assess need for dose adjustment (patients should record weight daily) • Becomes less effective as HF progresses, at high dietary intake of sodium, and with concurrent use of NSAIDs and COX-2 inhibitors • Diuretic resistance may be overcome by administering IV, combining two or more diuretics, or using diuretics with positive inotropic agents • SE: hypokalemia

Drug Class	Place in Therapy	Precautions and Monitoring
Digoxin	• May add if refractory to guideline-directed medical therapy • Use in concurrent atrial fibrillation: does not offer better ventricular rate control than beta blockers • Loading dose not recommended	• Monitor for digoxin toxicity (levels > 2 ng/dL with symptoms anorexia, nausea, vomiting, visual changes, or cardiac arrhythmias) • Withdrawal of digoxin in clinically stable patients with HFrEF may lead to recurrence of HF symptoms cardiac arrhythmias) • Withdrawal of digoxin in clinically stable patients with HFrEF may lead to recurrence of HF symptoms
Ivabradine	• Indicated for NYHA class II-III, normal sinus rhythm, heart rate ≥ 70 bpm on maximally tolerated dose beta blocker	• Contraindicated in acute decompensated HF, blood pressure < 90/50 mmHg, severe hepatic impairment • Monitor for atrial fibrillation, bradycardia, and conduction disturbances

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

2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology Foundation/ American Heart Association Task Force on Practice Guidelines

2017 American College of Cardiology/American Heart Association/Heart Failure Society of America (ACC/AHA/HFSA) Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure (HF):

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