

# Heart Failure Guideline

These clinical guidelines are designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients. They are not intended to replace a clinician’s judgment or to establish a protocol for all patients with a particular condition. A guideline will rarely establish the only approach to a problem.

## GUIDELINE HISTORY and APPROVAL

ACTION	SEED GUIDELINE and/or MAIN INFORMATION & GROUP SOURCE(S)	DATE	ORGANIZATION
Guidelines reviewed, revised and approved	Institute for Clinical Systems Improvement (ICSI) CHF Guideline as based on AHCPR (now AHQR) Guideline. Also based on the original Geisinger Health System Guideline (1999).	July 5, 2001	Geisinger Health Plan/ Clinical Guideline Committee
Guideline reviewed and approved	Same as above	July 25, 2001	Geisinger Health Plan/ Quality Improvement Committee
Guideline reviewed, revised and approved	ICSI CHF in Adults Guideline (January 2002 version) as based on AHCPR CHF Guideline (now AHQR)	December 11, 2002	Geisinger Health Plan/ Guideline Review Conference
Guideline reviewed and approved	Same as above	January 2, 2003	Geisinger Health Plan/ Clinical Guideline Committee
Guideline reviewed and approved	Same as above	January 22, 2003	Geisinger Health Plan/ Quality Improvement Committee
Guideline reviewed, revised and approved	1.) ICSI CHF in Adults Guideline (January 2002 version) as based on AHCPR CHF Guideline (now AHQR). 2.) GHP CHF Guideline (January 2003 Version). 3.) American College of Cardiology/ American Heart Association Guidelines for Evaluation and Management of Chronic Heart Failure in the Adult 2001.	August 27, 2003 – September 3, 2003	Geisinger Health Plan/ CHF Team
Guideline reviewed and approved	Same as above	September 4, 2003	Geisinger Health Plan/ Clinical Guideline Committee
Guideline reviewed and approved	Same as above	October 17, 2003	Geisinger Health Plan MMAC
Guideline reviewed and approved	Same as above	October 22, 2003	Geisinger Health Plan/ Quality Improvement Committee
Guideline reviewed and approved	Same as above	November 19, 2003	Geisinger Health Plan/ Medical Management Committee (MMC)
	1) ICSI Heart Failure in Adults (2007)		

**GUIDELINE HISTORY and APPROVAL (continued)**

Guideline reviewed and approved	Same as above	June 22, 2005	Geisinger Health Plan/ Medical Management Administrative Committee (MMAC)
Guideline reviewed and approved	Same as above	July 27, 2005	Geisinger Health Plan/ Quality Improvement Committee
Guideline reviewed	1. ICSI Heart Failure in Adults Guideline (August 2006 version) 2. American College of Cardiology/ American Heart Association Guidelines for Evaluation and Management of Chronic Heart Failure in the Adult 2005. 3. GHP CHF Guideline (January 2005 Version)	Jan. 15, 2007 Mar. 19, 2007	Geisinger Health Plan/ Clinical Guideline Committee
Guideline Reviewed	Same as above.	Feb 7-28 , 2007	Geisinger Health Plan Pharmacy Dept.
Guideline Reviewed	Same as above.	May 23 – Jun 4, 2007	Geisinger Health Plan Medical Directors
Guideline Reviewed	Same as above.	July 2, 2007	Geisinger Health Plan/ Medical Management Committee (MMC)
Guideline Reviewed	Same as above.	July 25, 2007	Geisinger Health Plan/ Quality Improvement Committee
Guideline Reviewed	1. ICSI Heart Failure in Adults (2007) 2. American College of Cardiology/ American Heart Association Guidelines for Evaluation and Management of Chronic Heart Failure in the Adult 2005. 3. GHP CHF Guideline ( Jan. 2007 Version)	Oct. 13 - , 2008	Geisinger Health Plan/ Clinical Guideline Committee
Guideline Reviewed	Same as above.	Feb. 3 - , 2009	Geisinger Health Plan Pharmacy Dept.
Guideline Reviewed	Same as above.	June 15, 2009	Geisinger Health Plan/ Medical Management Committee (MMC)
Guideline Reviewed	Same as above.	June 8-19, 2009	Geisinger Health Plan Medical Directors
Guideline Reviewed	Same as above.	July 22, 2009	Geisinger Health Plan/ Quality Improvement Committee
Guideline Reviewed	1. ICSI Heart Failure in Adults (2010) 2. American College of Cardiology/ American Heart Association Guidelines for Evaluation and Management of Chronic Heart Failure in the Adult	May 2011	Geisinger Health Plan/ Clinical Guideline Committee

	2005. 3. GHP CHF Guideline ( Jan. 2007 Version)		
Guideline Approved	Same as above.	July 27, 2011	Geisinger Health Plan/ Quality Improvement Committee

Duane E. Davis, M.D.  
Vice President, Chief Medical Officer  
Geisinger Health Plan

**OVERVIEW**

Approximately 4.9 million Americans have heart failure, and 550,000 new cases are diagnosed each year. The condition is slightly more common among men than women and is twice as common among African Americans as whites.

1 million people hospitalized annually (including readmission rates of 30% to 60%), and over 260,000 annual deaths from heart failure. The death rate attributed to heart failure rose by 148 percent during the period from 1979 to 2000. Heart failure mortality is about twice as high for African Americans as whites for all age groups. The prognosis of patients with a new diagnosis of heart failure is poor. Senni, et al. (1998) noted survival to be 86% at three months, 76% at one year, and only 35% at five years.

Heart failure’s growing presence as a health problem reflects the Nation’s changing population: More people are living longer. People age 65 and older represent the fastest growing segment of the population, and the risk of heart failure increases with age. The condition affects 1 percent of people age 50, but about 5 percent of people age 75.

**REFERENCE**

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Services  
National Institute of Health  
National Heart, Lung, and Blood Institute  
NIH Publication No. 95-923  
Reprinted May 1997

This site is accessible at: <http://www.nhlbi.nih.gov/health/public/heart/other/hrtfail/hm#what%20is>

### **SEED GUIDELINE(S)**

- Institute for Clinical Systems Improvement (ICSI) Heart Failure in Adults. Tenth Edition, August 2007 [http://www.icsi.org/heart\\_failure\\_2/heart\\_failure\\_in\\_adults\\_.html](http://www.icsi.org/heart_failure_2/heart_failure_in_adults_.html)
- *Heart Failure: Management of Patients With Left-Ventricular Systolic Dysfunction* Quick Reference Guideline Number 11 *AHCPR Publication No. 94-0613*: June 1994 National Library of Medicine DOCLINE Information: MED/94282113. The Agency for Healthcare Policy and Research (AHCPR) is now known as the Agency for Healthcare Research Quality (AHRQ).
- ACC/AHA 2005 Guideline Update for the Diagnosis and management of Chronic Heart failure in Adult – Summary Article: A Report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines. *Circulation* 2005;112:1825-1852.
- This is also based on the original Geisinger Health System CHF guideline (2005 version).

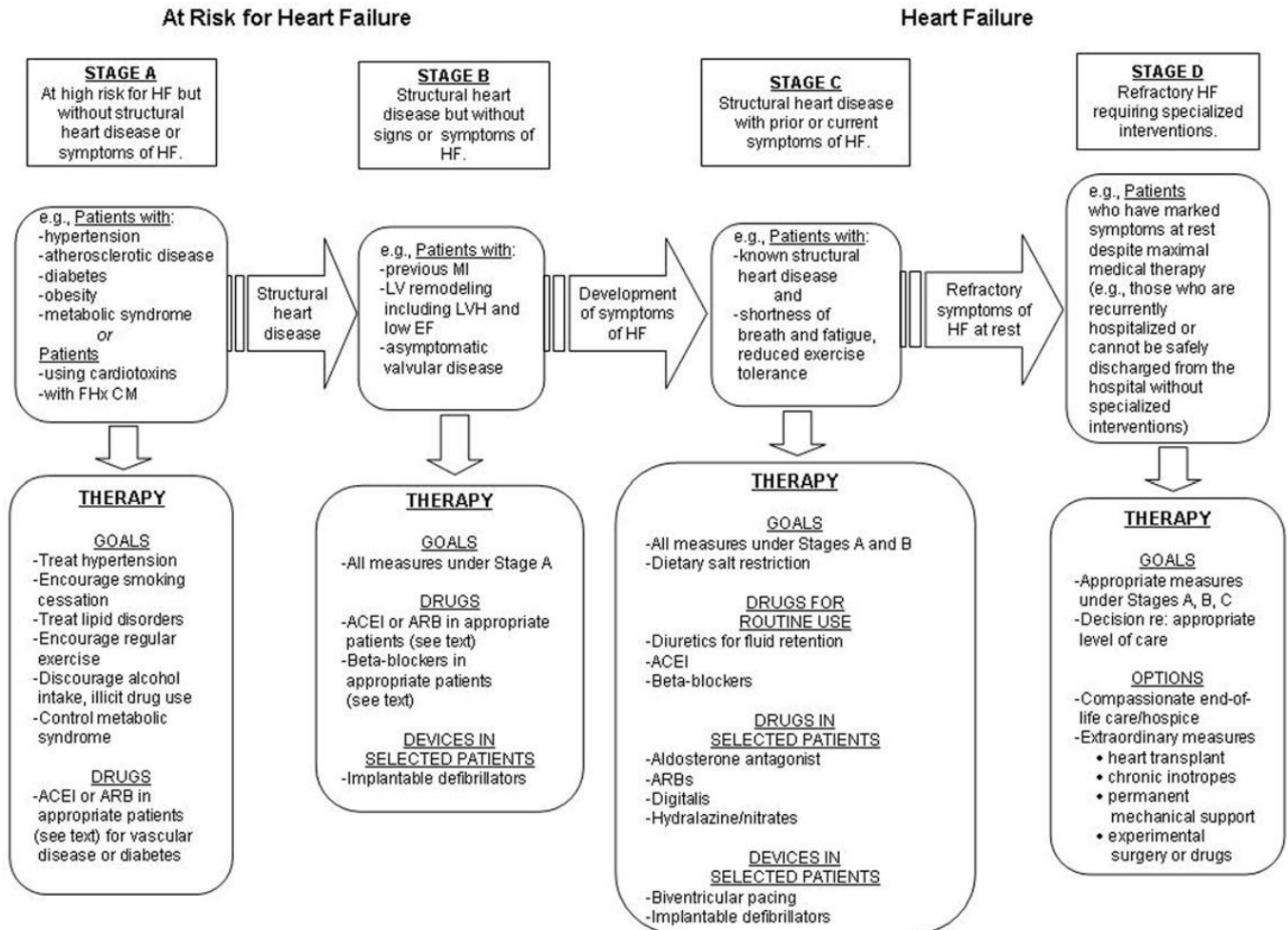
### **GOALS**

1. Increase number of patients with suspected heart failure that undergo baseline echocardiography or radionuclide ventriculography to measure left ventricular ejection fraction. In addition, reduce the number of repeat studies of ejection fraction, since clinical management of congestive heart failure is based upon patient history and physical examination.
2. Increase the number of patients with systolic dysfunction that receive a trial of ACE inhibitors, unless there is a specific contraindication to use these agents.
3. Increase the number of patients with heart failure that receive a trial of beta blocker therapy, unless there is specific contraindication to the use of these agents. Beta blockers must be used with caution in heart failure patients NOT already receiving an ACE inhibitor.
4. In addition to the regular physician follow-up and proper management with medications, increase the number of heart failure patients followed by a case manager to assure adequate patient education, medication compliance, coordination with other medical specialists and community.

## FAST FACTS

1. All patients with suspected heart failure should undergo baseline echocardiography or radionuclide ventriculography to measure left ventricular ejection fraction. Repeat studies of ejection fraction are usually not needed, since clinical management of congestive heart failure is based upon patient history and physical examination.
2. All patients with systolic dysfunction should receive a trial of ACE inhibitors, unless there is a specific contraindication to the use of these agents.
3. All patients with heart failure in NYHA class II, III, or IV should receive a trial of beta blocker therapy, unless there is specific contraindication to the use of these agents. Beta blockers must be used with caution in heart failure patients NOT already receiving an ACE inhibitor.
4. If decompensation occurs while on ACE inhibitors and beta blockers, patients should be considered for therapy with spironolactone (mortality or morbidity benefit) and digoxin (morbidity benefit) unless a specific contraindication exists to the use of these agents.
5. In addition to regular physician follow-up and proper management with medications, involvement by a case manager can assure adequate patient education, medication compliance, coordination with other medical specialists and community resources which have also been shown to lower the risk of heart failure decompensation.
6. Clinical data have shown Angiotensin Receptor Blockers to be useful only as an alternative therapy on ACE inhibitor intolerant patients
7. The measurement of circulating levels of brain natriuretic peptide (BNP) and proBNP is useful in the diagnosis and prognosis of heart failure in patients with dyspnea of unknown etiology.

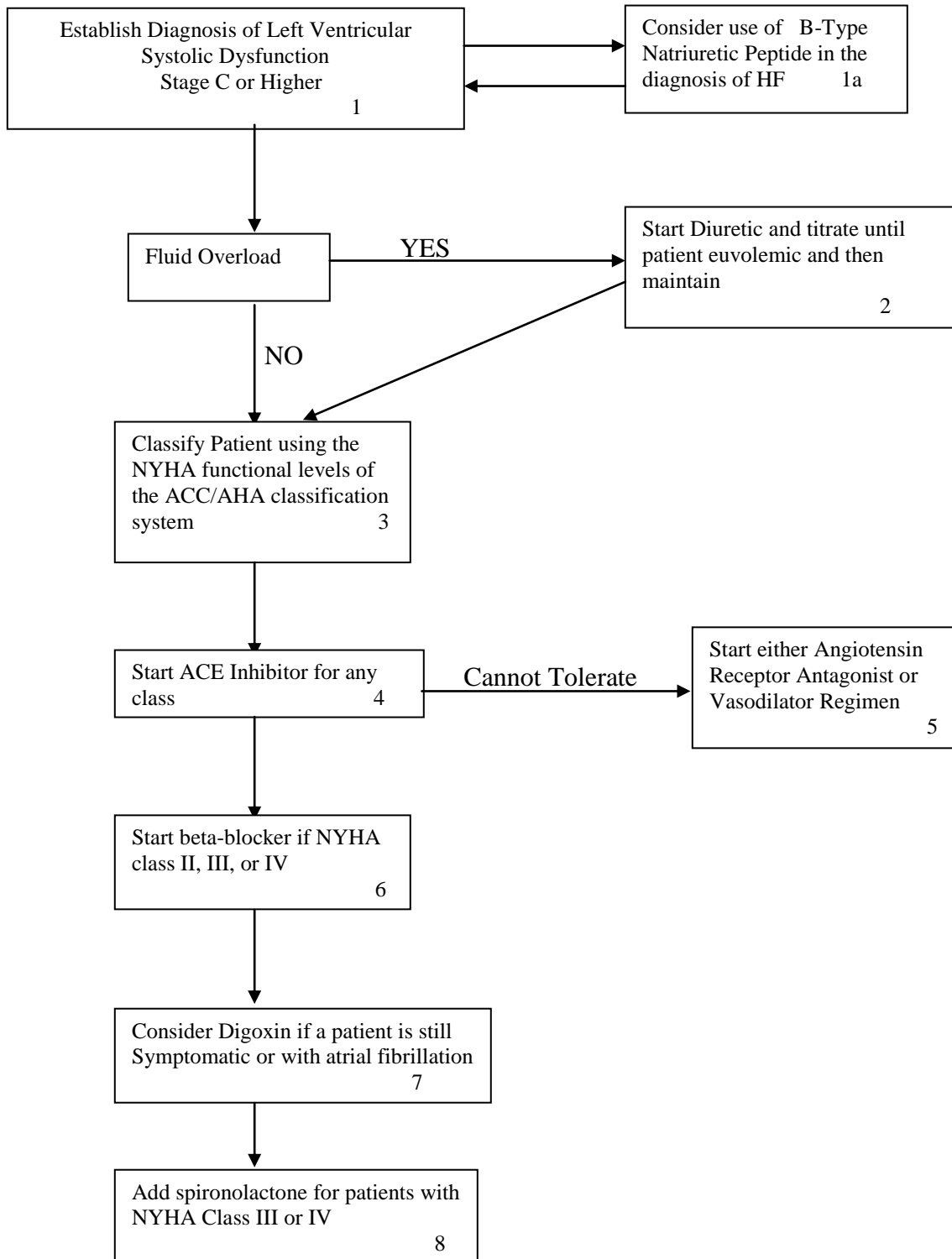
ALGORITHM



From:

**2009 Focused Update Incorporated Into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults**

## ALGORITHM



**Note: Pharmaceutical coverage is dependent upon individual pharmacy benefit design and certain drugs may require prior authorization. Providers are encouraged to review the GHP formulary at <http://www.thehealthplan.com>, or contact the Pharmacy Department at 1-800-988-4861.**

## ANNOTATIONS

This algorithm does not cover patients with Dystolic Dysfunction. These patients can be difficult to manage and may benefit from Cardiologist or Heart Failure specialist referral. Patients with difficulty to control heart failure of any kind may benefit from the ongoing management by a cardiologist.

The following information is useful in the interpretation and application of the heart failure algorithm.

Patients both with new onset heart failure as well as those with an established diagnosis can be managed according to this algorithm. The recommended testing need not be done on routine follow-up, but the general principles should be considered with decompensations. Additional studies may be obtained depending on the clinical situation.

### 1. Establish Diagnosis of Left Ventricular Systolic Dysfunction.

All patients with suspected heart failure should undergo a baseline echocardiography or a radionuclide ventriculography to measure left ventricular ejection fraction. Whether an echocardiogram or nuclear imaging is chosen should be dependent on the availability and quality of the locally available studies. Systolic dysfunction is defined as an ejection fraction of < 40%. Repeat studies of ejection fraction are usually not needed, since clinical management of congestive heart failure based on patient history and physical examination.

- 1a. Recently, the measurement of circulating levels of brain natriuretic peptide has become available as a means of identifying patients with elevated left ventricular filling pressures who are likely to exhibit signs and symptoms of heart failure. The assessment of this peptide cannot reliably distinguish patients with systolic from those with diastolic dysfunction. However, it has been widely investigated as a biochemical marker for morbidity and mortality in patients with known heart failure. This information should be taken into consideration when assessing patients for heart failure.

2. Initial treatment will likely need to take place prior to the evaluation of myocardial function. Volume overload should continue to be treated throughout the remainder of the algorithm.

3. Classify the patient using the New York Heart Association's (NYHA) functional levels.

## Definitions of the functional levels of cardiac disease according to the New York Heart Association (NYHA) (Class I-IV)\*

Functional Capacity	Objective Assessment
<b>Class I.</b> Patients with cardiac disease but without resulting limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or anginal pain.	<b>A.</b> No objective evidence of cardiovascular disease
<b>Class II.</b> Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea, or aginal pain.	<b>B.</b> Objective evidence of minimal cardiovascular disease.
<b>Class III.</b> Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea, or aginal pain.	<b>C.</b> Objective evidence of moderately severe cardiovascular disease.
<b>Class IV.</b> Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of heart failure or the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased.	<b>D.</b> Objective evidence of severe cardiovascular disease.

\* <http://www.americanheart.org/presenter.jhtml?identifier=1712>

\* **The Criteria Committee of the New York Heart Association. Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels. 9<sup>th</sup> ed. Boston, Mass: Little, Brown & Co; 253-256.**

### Alternatively, the ACC/AHA Classification System can be used. Stages of Heart Failure

Stage	Description	Examples
A	Patients at high risk of developing HF because of the presence of conditions that are strongly associated with the development of HF. Such patients have no identified structural or functional abnormalities of the pericardium, myocardium or cardiac valves and have never shown signs or symptoms of HF.	Systemic hypertension; coronary artery disease; diabetes mellitus; history of cardiotoxic drug therapy or alcohol abuse; personal history of rheumatic fever; family history or cardiomyopathy.
B	Patients who have developed structural heart disease that is strongly associated with the development of HF but who have never shown signs or symptoms of HF.	Left ventricular hypertrophy of fibrosis; left ventricular dilatation or hypocontractility; asymptomatic valvular heart disease; previous myocardial infarction.
C	Patients who have current or prior symptoms of HF associated with underlying structural heart disease.	Dysnea or fatigue due to left ventricular systolic dysfunction; asymptomatic patients who are undergoing treatment for prior symptoms of HF.
D	Patients with advanced structural heart disease and marked symptoms of HF at rest despite maximal medical therapy and who require specialized interventions.	Patients who are frequently hospitalized for HF and cannot be safely discharged from the hospital; Patients in the hospital awaiting heart transplantation; patients at home receiving continuous intravenous support for symptom relief or being supported with a mechanical circulatory assist device; patients in a hospice setting for management of HF.

HF indicates heart failure.

Hunt SA, Baker DW, Chin MH, Cinquegrani MP, Feldman AM, Francis GS, Ganiats TG, Goldstein S, Gregoratos G, Jessup ML, Noble RJ, Packer M, Silver MA, Stevenson LW, AAC/AHA guideline for the evaluation 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 (Committee to Revise the 1995 Guidelines for the evaluation and Management of Heart Failure). American College of Cardiology web site. Available at : [http://www.aacc.org/clinical/guidelines/failure/hf\\_index.htm](http://www.aacc.org/clinical/guidelines/failure/hf_index.htm).

4. ACE inhibitors should routinely be used for any NYHA class control symptoms and improve mortality, unless contraindicated. Formulary ACE-I should be started and increased to the target dose if possible (see Table of medications at the end of the annotations).
5. Those that do not tolerate ACE inhibitors should be started on either Angiotensin Receptor Antagonist of Vasodilator Regimen. (see Table of medications at the end of the annotations).
6. Beta-blockers should be started if NYHA class II, III, or IV. Initiation of Beta-blockers in patients with CHF.

The following is one suggested approach to the introduction of Beta-blocker.

### **Initial Visit**

Current drug therapy will be examined and contraindications to beta-blocker will be considered. If the patient is deemed a suitable for beta-blocker therapy, they will continue in the drug titration protocol.

### **Drug Titration**

Clinical Studies have demonstrated beneficial outcomes in heart failure associated with the use of bisoprolol (1), metoprolol (2), and carvedilol (3). Lacking any head to head clinical trials, it is unknown if any particular beta-blocker is superior in the treatment of patients with heart failure. Widely accepted contraindications to beta-blockers include 1) atrioventricular block worse than first degree, significant hypotension and reversible airways disease. Since large clinical studies to date have been limited to patients with heart failure that were stable for 2-3 weeks, it is recommended beta blockers not be given to patients with unstable or poorly controlled heart failure. In addition, beta-blockers should be considered for patients who have been treated with diuretics, digoxin and angiotensin-converting enzymes inhibitors. When starting beta-blockers, initial dosage should be low, and increased gradually every 2-4 weeks monitoring closely for hypotension, bradycardia or worsening heart failure until the target dose is achieved.

Carvedilol (Coreg) and metoprolol (Toprol XL or generic metoprolol) can be used according to the perceived ability of the patient to tolerate the drug. For example, a patient with a history of reactive airways would likely receive the beta-1 selective beta-blocker, metoprolol. Carvedilol is currently the only beta-blocker approved for use in the treatment of heart failure. It was selected for study in patients with heart failure because of its non-selective and has vasodilatory properties making it potentially more tolerable. Long-term survival trails have also been preformed with metoprolol and bisoprolol demonstrating significant benefit. There are no large studies completed comparing the results of carvedilol and metoprolol. When using carvedilol, the first dose will be administered under close supervision as an outpatient. Vital signs including blood pressure, pulse and symptoms will be monitored prior to receiving the drug and in one half hour to one hour after receiving the dose. The patient will be encouraged to weigh himself/herself daily and to call or return promptly should symptoms occur (i.e. not wait until next scheduled visit). Worsening heart failure (i.e. increase in weight, shortness of breath, rales, edema, etc.) should not be taken as a drug failure unless adjustment of diuretics (including the necessary

IV diuretics) fails to provide reinstatement of a compensated state. If at any point the patient requires hospitalization or IV inotropic therapy, the beta-blocker may be discontinued, but only if absolutely necessary. Every effort should be made to restart the beta-blocker after such a discontinuation, unless heart failure appears refractory. It should be emphasized that some patients who undergo drug titration with beta blockers have a 4-6 week period of feeling mildly worse and a few will have a frank decompensation. Clinical improvement may not be noted until the second to third month of therapy (i.e. not unusual for the patients to worsen somewhat prior to seeing an improvement). Thus, persistence with therapy is encouraged unless frank decompensation occurs.

The patient will return at one to two week intervals for drug titration. The dose of beta-blocker should be increased each visit to a target dose of carvedilol of 25 mg BID (50 mg daily), and possible 50mg BID (100 mg daily) for patients >80 kg. Metoprolol should be titrated to a target dose of 200 mg daily.

Titration schedule for carvedilol:

Week 0	Coreg 3.125 mg BID ( a dose of 6.25 mg can be used)
Week 2	Coreg 6.25 mg BID
Week 4	Coreg 12.5 mg BID
Week 6	Coreg 25 mg BID
Week 8	Follow-up visit (50 mg BID could be considered)

Titration schedule for metoprolol:

Week 0	Toprol XL 12.5 mg daily ( ¼ 50 mg tablet) (dose of 25 mg can be used)
Week 2	Toprol XL 25 mg daily (½ of a 50mg tablet)
Week 4	Toprol XL 50 mg daily (1 full 50 mg tablet)
Week 6	Toprol XL 100 mg daily or metoprolol 50 mg BID
Week 8	Toprol XL 200 mg daily of metoprolol 100 mg BID
Week 10	Follow-up visit

Should decompensation or adverse effects occur during this dose titration period, attempts should be made to increase the dose of diuretic and continue the drug if at all possible. However, if the patient has an increase in his/her heart failure symptoms, drug titration may be slowed by:

1. Deciding to delay the increase if the study medication dose for 1-2 weeks, or
2. Deciding to reduce the dose (i.e., go back to the previous dose) temporarily and defer further titration for 1-3 weeks

Should other side effects of study medication occur, such as impotence, dizziness, lightheadedness, nightmares, etc., the clinician may choose to decrease the dosage of the drug. However, the clinician will endeavor to maintain the highest possible effective dose without side effects.

Suggested instructions for adjustment of Concomitant Medication for Vasodilatory symptoms During Beta blocker titration:

*Worsening symptomatic hypertension, asymptomatic hypotension with systolic blood pressure 80mmHg, or symptomatic vasodilation (e.g., dizziness, lightheadedness, syncope, headache, edema, etc.).*

Mild Symptoms: dose of concomitant medications should be keep constant, but the time of the administration of any concomitant medications should be separated (as widely possible) from time of administration of the study medication.

Moderate Symptoms: dose of the beta blocker should not be advanced, and the patient should continue to take the beta-blocker at the same dose. In addition, the dose of any concomitant medications should be reduced to allow the patient to tolerate a higher dose of the beta-blocker at a later time.

Concomitant medication can be adjusted at each visit to improve tolerability and achieve the target dose of beta-blocker. The dose of the background ACE inhibitor may be altered temporarily, i.e., reduced for 7 days or less and then returned to the original dose. If the dose of the ACE inhibitor is altered, every effort should be made to return it to the original level by the end of the titration.

Severe Symptoms (fainting, presyncope, or syncope): dose of the beta-blocker should be reduced and dosed of concomitant medication should be reduced.

Concomitant medication can be adjusted at each visit to improve tolerability ad achieve the target dose of beta-blocker. The dose of the background ACE inhibitor may be altered temporarily, i.e., reduced for 7 days or less and then returned to the original dose. If the dose of the ACE inhibitor is altered, every effort should be made to return it to the original level by the end of the titration.

7. Digoxin has been shown to improve LVEF and exercise tolerance modestly. Levels of 0.4-0.81 may be adequate for this effect.
8. Add Spironolactone for patients with NYHA Class III or IV.

The 'RALES' (Randomized Aldactone Evaluation Study Investigators) Study demonstrated a significant reduction in mortality, hospitalization and improvement in exercise tolerance when 25 to 50 mg of spironolactone was administered to patients with Class III or IV heart failure with left ventricular ejection fraction no more than 35%. Subjects in this trial were also being treated with ACE inhibitors and loop diuretics, and use of potassium sparing diuretics was not permitted. Patients with serum creatinine levels of 2.5mg% or higher, or a serum potassium of 5.0 mmol per liter or higher were excluded from this trial, as were patients with significant valvular heart disease (other than tricuspid or mitral regurgitation secondary to systolic heart failure), unstable angina, hepatic failure, cancer or any other life threatening disease. The most common adverse events were hyperkalemia and gynecomastia. On the basis of this single study, clinicians caring for patients with Class III or IV heart failure may wish to consider the use of spironolactone in these patients in addition to loop diuretics and ACE inhibitors if there is no other clinical contraindication.

**Note: Pharmaceutical coverage is dependent upon individual pharmacy benefit design and certain drugs may require prior authorization. Providers are encouraged to review the GHP formulary at <http://www.thehealthplan.com>, or contact the Pharmacy Department at 1-800-988-4861.**

MEDICATION (brand name)	INITIAL DOSE	MAXIMUM DOSE	COMMENTS
<b>ACE Inhibitors</b>			
Captopril (generic available)	6.25-12.5mg tid	50 mg tid	
Enalapril (generic available)	2.5-5 mg bid	10 -20 mg bid	
Fosinopril (Monopril ®, generic available)	5-10 mg qd	40 mg qd	
Lisinopril (Prinivil, Zestril ®)	2.5-5 mg qd	20 - 40 mg qd	
Quinapril (Accupril ®, generic available)	5-10 mg bid	20 mg bid	
Ramipril (Altace®)	1.25-2.5 mg bid	10 mg bid	
Benzapril (Lotensin)	5-10 mg per day	10-40 mg per day	
Trandolapril	1 mg qd	4 mg qd	
<b>ARB's</b>			
Candesartan	4-8 mg qd	32 mg qd	Angiotensin receptor blockers for the treatment of HF are recommended if ACE inhibitors are not tolerated because of cough or angioedema.
Losartan	25 -50 mg qd	50-100 mg qd	
Valsartan	40 mg bid	160 mg bid	
<b>Vasodilators</b>			
Hydralazine + Isosorbide Dinitrate Or mononitrate	25 mg qid 20 mg tid 40 mg qid	50 mgqid 40 mg tid 120 mg qd	
<b>Beta-Blockers (generic preferred for all)</b>			
Carvedilol (Coreg)	3.125 mg bid	20-50 mg bid	Patients with heart failure may worsen initially.
Metoprolol	6.25 mg bid	50-75 mg bid	
Metoprolol extended release (Toprol XL ®)	12.5-25 mg qd	200 mg qd	
Bisoprolol	1.25 mg qd	10 mg qd	
<b>Diuretics and/or spironolactone ( generic preferred for all)</b>			
Spironolactone (generic)	12.5 mg/d	25 mg/d	
Bumetanide	1 mg	4-8 mg	
Furosemide (generic)	40 mg	160-200 mg	
Torsemide	10 mg	100-200 mg	
Chlorothiazide	500 mg	1000 mg	
Hydrochlorothiazide	25 mg	50 mg	
<b>Other</b>			
Digoxin	0.125 mg/d	0.25 mg/d	Improves quality of life. Doesn't prolong survival.

**Device/Surgical**

- Cardiac transplantation is the only established surgical approach to treatment of refractory heart failure.
- Biventricular pacing or cardiac resynchronization therapy (CRT) improves the quality of life and decreases hospitalization from heart failure. CRT without implantable cardioverter defibrillator (ICD) has a trend of reducing mortality but does not reach statistical significance in one study. Thus there is strong evidence to support the use of CRT to improve symptoms, exercise capacity, quality of life, LVEF and survival, and to decrease hospitalization in patients with persistently symptomatic HF undergoing optimal medical therapy who have cardiac dyssynchrony (as evidenced by a prolonged QRS duration).
- ICD improves mortality in patients with ischemic and nonischemic heart disease with LV ejection fraction of less than 30%, regardless of symptoms or arrhythmias. ICD without CRT does not improve symptoms or reduce hospitalization from heart failure.
- Radiofrequency catheter ablation may be indicated in patients with heart failure and reciprocating tachycardias or selected patients with atrial fibrillation. However there is insufficient data on the role of ablation on sustained ventricular tachycardias in patients with heart failure.
- Revascularization should be considered in patients with significant coronary artery disease defined as left main disease, three-vessel disease, or two-vessel disease with proximal LAD involvement, with evidence of ischemia.
- Valve surgery is indicated in patients with severe left ventricular dysfunction, and severe mitral valve insufficiency or aortic stenosis surgery may lead to symptomatic improvement in selected heart failure patients.

**Left ventricular assist devices**

- Provide hemodynamic support as bridge to cardiac transplantation.
- Left ventricular assist devices as destination therapy for Stage D heart failure patients who are not candidates for heart transplant is investigational.

**Indications for ICD in HF:**

- Coronary artery disease with documented prior MI, EF less than or equal to 35%, an inducible sustained VT or VF at EP Study. (Note: MI and defibrillator must be greater than four weeks prior.)
- Documented prior MI, EF less than or equal to 30%. (Patient must not have Class IV HF, shock, CABG, PCI, MI within three months or a need for coronary revascularization or predicted survival less than one year.)
- EF less than or equal to 30% for greater than nine months.

---

**REFERENCES**

- Abraham WT, Fisher WG, Smith AL, et al. cardiac resynchronization in chronic heart failure. *NEJM* 2002;346:1845-1853.
- ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult [www.acc.org](http://www.acc.org)
- ACC/AHA Key Data Elements and Definitions for Measuring the Clinical Management and Outcomes of Patients With Chronic Heart Failure. 2005.  
<http://www.americanheart.org/presenter.jhtml?identifier=3004550>
- American Heart Association. Heart Disease and Stroke Statistics – 2005 Update. Dallas, TX: American Heart Association, 2005
- Bertram P, Faiex A, Remme W et al: The effect of spironolactone on morbidity and mortality in patients with severe heart failure. 1999;341:709-717.
- Bigger JT. Expanding indications for implantable cardiac defibrillators. *N Engl J Med* 2002;346:931-33.
- Brophy JM, Lawrence W, Rouleau J: Beta blockers in congestive heart failure. *Ann Int Med* 2001; 134:550-560.  
<http://www.annals.org/issues/v134n/abs/200104030-00008.html>
- Burger AJ, Horton DR, LeJemtel T, et al. Effect of nesiritide (B-type natriuretic peptide) and dobutamine on ventricular arrhythmias in the treatment of patients with acutely decompensated heart failure: the precedent study. *Am Heart J* 2002;144:1102-08.
- The Criteria Committee of the New York Heart Association. Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels. 9<sup>th</sup> ed. Boston, Mass: Little, Brown & Co; 253-256.
- Eichhorn E, Bristow MR: Practical guidelines for the initiation of beta-adrenergic blockade in patients with chronic heart failure (Edit). *Am J Cardiol*. 1997;79:794-798.
- Gomberg-Maitlans M, Baran DA, Fuster V: Treatment of congestive heart failure. Guidelines for the primary care physician and heart failure specialist. *Arch Int Med*. 2001;161:342-352.
- Hartmann F, Packer M, Coats J.S. A, et al. Prognostic impact of plasma n-terminal pro-brain natriuretic peptide in severe chronic congestive heart failure: a substudy of the carvedilol prospective randomized cumulative survival (COPERNICUS) trial. *Circulation* 2004; 110:1780-86.
- Hjalmarson A, Goldstein S, Fagerberg B et al., for the MERit-HF Study Group. Effects of controlled-release metoprolol on total mortality, hospitalization, and well being in patients with heart failure. *JAMA* 2000; 283:1295-1302.
- Hunt SA, Baker DW, Chin MH, Cinquegrani MP, Feldman AM, Francis GS, Ganiats TG, Goldstein S, Gregoratos G, Jessup ML, Noble RJ, Packer M, Silver MA, Stevenson LW, AAC/AHA guideline for the

evaluation 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 (Committee to Revise the 1995 Guidelines for the evaluation and Management of Heart Failure). American College of Cardiology web site. Available at : [http://www.aacc.org/clinical/guidelines/failure/hf\\_index.htm](http://www.aacc.org/clinical/guidelines/failure/hf_index.htm).

Jamali AH, Wilson Tang WH, Khot UN, Fowler MB: The role of angiotensin receptor blockers in the management on chronic heart failure. *Arch Int Med*. 2001;161:667-672.

Kadish A, Dyer A, Daubert JP, et al. Prophylactic defibrillator implantation in patients with nonischemic dilated cardiomyopathy. *N Engl J Med* 2004;350:2151-58.

Konstam et al. Contemporary options for treating patients with heart failure. *Circulation* 2002; 105:2244-2246

Moss AJ, Zarba W, Hall WJ, et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. *NEJM*. 2002;376:877-883.

Mueller C, Scholer A, Luale-Kilian K, et al. Use of B-type natriuretic peptide in the evaluation and management of acute dyspnea. *N Engl J Med* 2004;350:647-54.

Owan TE, Hodge DO, Herges RM , et al. Trends in prevalence and outcome of heart failure with preserved ejection fraction. *NEJM* 2006;355:251-259.

Packer M, Bristow MR, Cohn JN et al for the US Carvedilol Heart Failure Study Group: The effect of carvedilol on morbidity and mortality in patients with chronic heart failure. *New Engl J Med* 1996;334:1349-1355.

Persson H, Lonn E, Edner M, et al. Diastolic dysfunction in heart failure with preserved systolic function: need for objective evidence: results from the CHARM echocardiographic substudy – CHARMES. *J Am Coll Cardiol* 2007;49:687-94.

Perry E: Diagnosis and management of dilated cardiomyopathy. *Heart* 2000;84:106-112.

Pitt et al. Randomized trial of losartan versus Captopril on mortality in patients with symptomatic heart failure: the Losartan Heart Failure Survival Study: ELITE II. *Lancet* 2000;355:1582.

Pitt B, Zannad F, Remme WJ, et al. The effect of spironolactone on morbidity and mortality on patients with severe heart failure. *New Engl J Med* 1999; 341:709-17.

Senni M, Tribouilloley CM, Rodeheffer RJ, et al. Congestive heart failure in the community: a study of all incident cases in Olmstead County, Minnesota, in 1991. *Circulation* 1998;98:2282-89.

Tsutamoto T, Wada A, Maeda K, et al. Plasma brain natriuretic peptide level as a biochemical marker of morbidity and mortality in patients with asymptomatic or minimally symptomatic left ventricular dysfunction: comparison with plasma angiotensin II and endothelin-1. *Eur Heart J*. 1999;20:1799-807.

## **MEASURES**

- Percent of members with HF Stage C or higher on ACE or ARB or contraindication
- Percent of members with Stage C or D on Beta blocker
- ER rate/1000
- Hospital days/1000
- Average length of stay