

Heart Failure Management Guidelines



### Preface

At MultiCare we are committed to standardizing the care of our heart failure patients in order to improve the overall quality of care and outcome for our patients. It is our core belief that effectively standardizing the care for our heart failure patients will ultimately result in a change in their course for this chronic condition- i.e., reducing hospitalizations, rehospitalizations, and mortality for our patients. As we know, the American Heart Association (AHA) and American College of Cardiology (ACC) have published evidenced-based and best practice guidelines for heart failure management and treatment. In an effort to incorporate these well-established guidelines and tailor them to our individual patients, we at MultiCare collaboratively drafted a short booklet which reflects what we consider to be the best practice of care for our heart failure patients.

This booklet is a product of the MultiCare Heart Failure Collaborative, a collective coalition representing the multiple disciplines and facets of healthcare that touch each of our heart failure patient's care. Through a rigorous process of source gathering and review, and the tremendous investment by the many individuals within the Collaborative, this booklet was prepared and edited with the intention to be available as a resource for providers of heart failure patients. We also wish to acknowledge the significant contributions of Dr. Needham Ward, whose early efforts led to the inception of this booklet. We welcome any additional feedback or thoughts regarding the booklet that you might have. As this chronic condition is ever-evolving we hope to concurrently provide up-to-date information and revisions as they become available.

#### Developed by MultiCare Cardiac Services Department / Heart Failure Collaborative

(The following management guidelines are intended for health care providers administering care to heart failure patients. They may be modified to meet the special or specific needs of certain patients, as establish by the patient's provider)

MultiCare Health S	ystem

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### Introduction

This document represents a critical part of the MultiCare Health System (MHS) Heart Failure Collaborative vision: To standardize heart failure care across the continuum of care at MHS, by incorporating evidence-based guidelines. We believe that medical management standardization and adherence to national guidelines will improve patient satisfaction and quality of life.

Another equally important priority of this work is to demonstrate reductions in 30-day all-cause heart failure readmissions.

Reducing re-hospitalization for heart failure patients is a priority for MultiCare Health System and many healthcare systems nationwide. The Institute for Healthcare Improvement (IHI) and other national healthcare quality improvement organizations have identified strategies to help achieve this goal. In addition to optimal medical management outlined in this document, the following approaches showed promising results:

- 1. Follow up appointment within days (preferably 2-5 days) after a hospitalization.
- 2. Patient education:
  - a. Self-care behaviors:
    - 1) Take medications as prescribed
    - 2) Monitor daily weights
    - 3) Stay active every day
    - 4) Follow low salt, fluid restricted diet (dietician consult for education)
    - 5) Recognize symptoms of heart failure and how to respond (see Patient Action Plan, appendix B)
  - b. Risk factor modification diabetic education, smoking cessation, counseling, obesity
  - c. Use Teach Back: Ask patient/caregiver to verbalize understanding of instructions by restating in her/his own words.
- 3. Medication reconciliation at every visit, admission, and discharge. Reduce the number of medications, to the extent possible.
- 4. Use of a Patient Action Plan and flexible diuretic titration protocol (see appendix B).
- 5. Care coordination with help of Care Management.
- 6. Use of a checklist to include all points above medications, education, follow up, and care coordination following hospital discharge (see appendix C).

### A. Definition of Heart Failure

Heart Failure is a syndrome characterized by:

- High mortality
- Frequent hospitalizations
- Reduced quality of life
- Complex therapeutic regimens
- High cost to society

Heart failure (HF) is a syndrome characterized by either or both pulmonary and systemic venous congestion and/or inadequate peripheral oxygen delivery, at rest or during stress, caused by cardiac dysfunction. Symptoms may not correlate with severity of the disease.

The above short definition comes from the following working definition created by the Heart Failure Society of America:

HF is a syndrome caused by cardiac dysfunction, generally resulting from myocardial muscle dysfunction or loss and characterized by either LV dilation or hypertrophy or both. Whether the dysfunction is primarily systolic or diastolic or mixed, it leads to neurohormonal and circulatory abnormalities, usually resulting in characteristic symptoms such as fluid retention, shortness of breath, and fatigue, especially on exertion. In the absence of appropriate therapeutic intervention, HF is usually progressive at the level of both cardiac function and clinical symptoms. The severity of clinical symptoms may vary substantially during the course of the disease process and may not correlate with changes in underlying cardiac function. Although HF is progressive and often fatal, patients can be stabilized and myocardial dysfunction and remodeling may improve, either spontaneously or as a consequence of therapy. In physiologic terms, HF is a syndrome characterized by either or both pulmonary and systemic venous congestion and/or inadequate peripheral oxygen delivery, at rest or during stress, caused by cardiac dysfunction. Symptoms may not correlate with severity of the disease.

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 480.

### **B. Systolic and Diastolic Heart Failure**

"HF With Reduced Left Ventricular Ejection Fraction (LVEF less than 50%)" Sometimes: "HF With a Dilated Left Ventricle"	A clinical syndrome characterized by signs and symptoms of HF and reduced LVEF. Most commonly associated with LV chamber dilation.
"HF With Preserved LVEF greater than 50%" : HF – PEF (diastolic HF)	A clinical syndrome characterized by signs and symptoms of HF with preserved LVEF. Most commonly associated with a nondilated LV chamber. May be the result of valvular disease or other causes.
"Myocardial Remodeling"	Pathologic myocardial hypertrophy or dilation in response to increased myocardial stress. These changes are generally accompanied by pathologic changes in the cardiac interstitium. Myocardial remodeling is generally a progressive disorder.

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 480.

(Note: by the change of the EF to less than 50% (was less than 40%) it is a change from the Lindenfeld reference.)

Table 1. Ejection Fraction (EF)		
Hyperdynamic	greater than 70%	
Normal	50-70%	
Low Normal	50-55%	
Mild Systolic dysfunction	40-50%	
Moderate Systolic Dysfunction	30-40%	
Moderately Severe Systolic Dysfunction	20-30%	
Severe Systolic Dysfunction	less than 20%	
Note: Ejection fraction does not necessarily correlate with functional class (symptoms)		

Age appropriate Diastolic Dysfunction: Echocardiographic finding of Grade I diastolic dysfunction is normal for age greater than 60 years and should not be considered or called diastolic heart failure.

### C. Classification of Heart Failure

Table 2. NYHA Classifications versus ACC/AHA Heart Failure Stages		
New York Heart Association (NYHA) Functional Classes	ACC/AHA Stages of Heart Failure	Approach
<b>Class I:</b> Ordinary physical activity does not cause undue fatigue, palpitations, or dyspnea.	<b>Stage A:</b> Patients at risk for developing heart failure.	Prevent Disease
	<b>Stage B:</b> Patients who have developed structural heart disease, but have never shown signs or symptoms of heart failure.	Treat Early
<b>Class II:</b> Patients are comfortable at rest. Ordinary physical activity results in symptoms.	<b>Stage C:</b> Patients who have current or prior symptoms of heart failure, with underlying structural disease.	Treat Aggressively
<b>Class III:</b> Patients are comfortable at rest. Less than ordinary activity causes symptoms.		
<b>Class IV:</b> Patients are unable to carry on any activity without symptoms. Symptoms may occur at rest.	<b>Stage D:</b> Patients with advanced structural heart disease and marked symptoms of heart failure at rest despite maximal medical therapy, AND who require specialized interventions.	Consider Specialty Referral

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 12.

### D. Causes of Heart Failure

Table 3. Po	ssible causes of systolic and diastolic heart failure
Systolic	Coronary artery disease (CAD)     MI     Ischemia (hibernating myocardium, stunned     myocardium)     Hypertension     Non-coronary artery disease     Alcoholic cardiomyopathy     Peripartum cardiomyopathy     Valvular cardiomyopathy     Drug-induced cardiomyopathy     Idiopathic cardiomyopathy
Diastolic	<ul> <li>Hypertrophic cardiomyopathy</li> <li>Acute coronary insufficiency</li> <li>Systemic hypertension with hypertrophy</li> <li>Acute and chronic CAD</li> <li>Infiltrative cardiomyopathy</li> </ul>

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Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 9.

### E. Precipitating Factors of Volume Overload

- · Non-compliance with medications
- Dietary indiscretion (excess sodium, fluid)
- Renal dysfunction
- NSAIDs
- Negative Inotropes
- Arrhythmias
- Anemia

- Systemic infection
- Pulmonary Embolism
- Valvular disease
- Alcohol
- Thyrotoxicosis
- Coronary ischemia

### F. Ruling out and treating other conditions and causes

Table 4. Ruling out and treating other conditions and causes		
Conditions that mimic or provoke heart failure	<ul> <li>Pulmonary disease</li> <li>Myocardial infarction</li> <li>Arrhythmias</li> <li>Anemia</li> <li>Renal failure</li> <li>Nephrotic syndrome</li> <li>Thyroid disease</li> <li>Hepatic insufficiency</li> </ul>	<ul> <li>Venous insufficiency</li> <li>Hemochromatosis</li> <li>Sleep apnea</li> <li>Sarcoidosis</li> <li>Paget's disease</li> <li>Arteriovenous malformations</li> <li>Recent trauma</li> </ul>
Reversible causes of heart failure	<ul> <li>CAD</li> <li>Hypertension</li> <li>Throytoxicosis</li> <li>Myxedema</li> <li>Valve lesions</li> <li>Alcohol or drugs</li> <li>Arrythmias</li> <li>Anemia</li> </ul>	<ul> <li>Malnutrition</li> <li>Infiltrative condition</li> <li>Cardiac tumors</li> <li>Intracardiac shunts</li> <li>Pheochromocytoma</li> <li>Connective tissue disorder</li> <li>Infectious myocarditis</li> </ul>

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 9.

### G. Symptoms of Heart Failure

Table 5. Symptoms Su	ggesting the Diagnosis of HF
Symptoms	<ul><li>Dyspnea at rest or on exertion</li><li>Reduction in exercise capacity</li></ul>
	Orthopnea
	Paroxysmal nocturnal dyspnea (PND) or nocturnal
	cough
	• Edema
	Ascites or scrotal edema
Less specific	Early satiety, nausea and vomiting, abdominal
Presentations of HF	discomfort
	Wheezing or cough
	Unexplained fatigue
	Confusion/delirium
	Depression/weakness (especially in the elderly)

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 482.

### H. Signs of Heart Failure

Table 6. Signs to Evaluate in Patients Suspected of Having HF	
Cardiac Abnormality	Sign
Elevated cardiac filling pressures and fluid overload	<ul> <li>Elevated jugular venous pressure</li> <li>S3 gallop</li> <li>Rales</li> <li>Hepatojugular reflux</li> <li>Ascites</li> <li>Edema</li> </ul>
Cardiac enlargement	<ul><li>Laterally displaced or prominent apical impulse</li><li>Murmurs suggesting valvular dysfunction</li></ul>
Reduced cardiac output	<ul> <li>Narrow pulse pressure</li> <li>Cool extremities</li> <li>Tachycardia with pulsus alternans</li> </ul>
Arrhythmia	Irregular pulse suggestive of atrial fibrillation or frequent ectopy

Lindenfeld J. et al, (2010). Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 482.

### I. Treatment Goals

# Table 7. Treatment Goals for Patients Admitted for Acute Decompensated Heart Failure

- Improve symptoms, especially congestion and low-output symptoms
   Restore normal oxygenation
- Optimize volume status
- Identify etiology
- Identify and address precipitating factors
- Optimize chronic oral therapy
- Minimize side effects
- Identify patients who might benefit from revascularization
- Identify patients who might benefit from device therapy
- Identify risk of thromboembolism and need for anticoagulant therapy
- Educate patients concerning medications and self management of HF
- · Consider, and where possible, initiate a disease management program

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 498.

### J. Initial Evaluation

- 1. Lab:
  - a. CBC, CMP, BNP, Magnesium
  - b. Hgb Alc
  - c. Lipids
  - d. TSH
  - e. Iron, IBC, Ferritin
  - f. UA
- 2. EKG
- 3. Chest X-ray
- 4. Echocardiogram
- 5. Sleep Study if indicated
- 6. Rule out Ischemic Etiology:
  - a. Nuclear Stress Test
  - b. Coronary CTA
  - c. Six minute walk test
  - d. Cardiac Catheterization (left and right)

Call for a Cardiology consult if:

- 1. EF less than or equal to 40%
- 2. Ongoing symptoms, volume overload
- 3. Complicated medical regimen
- 4. Diagnostic evaluation

### K. Primary Care Physician Clinic Visit

#### Patient with CHF – Clinic visitcontent

Main Questions:

- Shortness of Breath
- Edema
- Orthopnea
- PND (Paroxysmal Nocturnal Dyspnea)
- Weight
- Fluid Intake
- Diet sodium intake

Physical Examination:

- Blood pressure and heart rate
- Weight
- Jugular venous distension
- Rales
- S<sub>3</sub> gallop, murmur
- Edema

Laboratory testing:

- BMP
- BNP

Imaging:

Echocardiogram

Medications:

- ACE/ARB
- Carvedilol
- Metoprolol Succinate
- Spironolactone
- Diuretics

Cardiology Consult:

- EF less than or equal to 40%
- Ongoing symptoms, volume overload
- Complicated medical regimen
- Diagnostic evaluation

Consider Heart Failure Clinic:

- Optimization of medical management
- Education
- Post discharge
- Close follow up

### L. Role of the Echocardiogram

The single most useful diagnostic test in the evaluation of patients with HF is the comprehensive 2-dimensional echocardiogram coupled with Doppler flow studies to determine whether abnormalities of myocardium, heart valves, or pericardium are present and which chambers are involved. Three fundamental questions must be addressed:

- 1) Is the LV ejection fraction (EF) preserved or reduced?
- 2) Is the structure of the LV normal or abnormal?
- 3) Are there other structural abnormalities such as valvular, pericardial, or right ventricular abnormalities that could account for the clinical presentation?

This information should be quantified with a numerical estimate of EF, measurement of ventricular dimensions and/or volumes, measurement of wall thickness, and evaluation of chamber geometry and regional wall motion...A comprehensive echocardiographic evaluation is important, because it is common for patients to have more than 1 cardiac abnormality that contributes to the development of HF. Furthermore, the study may serve as a baseline for comparison, because measurement of EF and the severity of structural remodeling can provide useful information in patients who have had a change in clinical status or who have experienced or recovered from a clinical event or received treatment that might have had a significant effect on cardiac function. Repeat assessment of EF may be most useful when the patient has demonstrated a major change in clinical status. Routine assessment of EF at frequent, regular, or arbitrary intervals is not recommended.

Jessup, M., Abraham, W.T., Casey, D.E., Feldman, A.M., Francis, G.S., Ganiats, T.G., et al (2009). Focused update: ACCF/AHA guidelines for the diagnosis and management of heart failure in adults. Circulation, 119:1984-1985.

### **M. Medications**

#### OVERVIEW

The medication recommendations in the IHC algorithms come from various sources, including the Agency for Health Care Policy and Research (AHCPR), the American College of Cardiology (ACC), the Heart Failure Society of America (HFSA), and the American Heart Association (AHA). Following is a summary of recommended medications and their benefits. Refer to Tables 8-19 for specific guidelines for medication administration.

• ACE inhibitors are the first line treatment and cornerstone of heart failure drug therapy. They should be prescribed for all patients with LV ejection fractions less than 40%, even those who are asymptomatic.

#### Alternatives to ACE inhibitors:

- Angiotensin II Receptor Blockers (ARBs) are a reasonable alternative (2nd line) in heart failure when ACE inhibitors are not tolerated or an ACE inhibitor induced cough is present.
- **Direct-acting vasodilators** (isosorbide dinitrate in combination with hydralazine HCL) are a 3rd alternative if the patient is both ACE- and ARB-intolerant due to hyperkalemia or decreased renal function.
- **Beta blockers** are also first line treatment, in addition to an ACE inhibitor, for patients with stable heart failure and a documented EF less than 40%. They can increase survival when they are added to ACE inhibitor therapy (may not be tolerated in class IV or stage D).
- **Hydralazine and Nitrate** should be added through a titration process for African American patients. This is in addition to ACEI/ARB and beta blocker.
- **Diuretics** should be used for volume overload. Their use provides clear clinical benefit in terms of morbidity. **Potassium** should be used to correct hypokalemias for patients who are chronically treated with non-potassium-sparing diuretics.
- **Spironolactone** (aldosterone antagonist) should be considered for patients with ejection fraction less than 30% or NYHA Class III/IV heart failure.
- · Digoxin and warfarin / dabigatran should be used for patients in atrial fibrillation.
- · Nitrates for patients with angina.

#### HEART FAILURE MEDICATION INFORMATION

The medication tables on the following pages list some of the most commonly prescribed generic and brand-name drugs in each category. Those that are available in generic form are preferred by many health plans, and are marked with an asterisk (\*).

Table 8. ACE Inh	nibitors (ACEI)		
Indications/Key Points	<ul> <li>Block activation of the renin-angiotension system.</li> <li>Improve survival across the entire heart failure spectrum—mild, moderate, and severe—and delay progression of asymptomatic LV dysfunction to overt heart failure.</li> <li>Proven to improve symptoms, decrease hospitalizations, and decrease mortality in patients with heart failure.</li> <li>May be safely initiated even if systolic blood pressure as low as 90 mm Hg: Risk of hypotension increased with hypovolemia; consider decreasing diuretic dose prior to ACEI initiation or titration.</li> <li>Therapy should continue for life.</li> </ul>		
Medications *=generic available	Initiation/Titration	Target dose	Maximum daily dose
*lisinopril (Prinivil, Zestril)	Start at 2.5 mg daily; increase by 5 mg every week until target dose reached.	20 mg daily	40 mg
*enalapril (Vasotec)	Start at 2.5 mg bid; increase by 2.5 mg per dose every week until target dose reached.	10 mg bid	40 mg
*captopril (Capoten)	Start at 6.25 mg tid; increase by 6.25 to 12.5 mg per dose every 2 weeks until target reached.		300 mg
Monitoring/Labs	<ul> <li>Obtain BMP for evaluation of K+ and creatinine at baseline and one week following each dose titration.</li> <li>Monitor for elevations in K+ (greater than 5.0); decrease K+ supplementation or modify target dose of ACEI.</li> <li>Cautious use of ACEI in patients if creatinine greater than 3.0</li> <li>Do not start ACEI, if GFR less than 30 ml/min</li> </ul>		
Contraindications	<ul> <li>Shock</li> <li>Angioneurotic edema</li> <li>Hyperkalemia (greater than 5.5 mm/L) off potassium supplement</li> </ul>		
Precautions	<ul> <li>Renal impairment (creatinine greater than 3.0)</li> <li>Do not start ACEI, if GFR less than 30 ml/min</li> <li>Mild hyperkalemia (greater than 5.0 mm/L) off potassium supplement</li> <li>Dialysis</li> <li>Hypovolemia (consider decreasing diuretic dose if applicable)</li> <li>Cerebrovascular disease</li> <li>Renal artery stenosis</li> <li>Hypotension (systolic BP less than 90 mm Hg)</li> </ul>		
Adverse Reactions	<ul> <li>Dizziness</li> <li>Nausea</li> <li>Headache</li> <li>Hyperkalemia</li> <li>Fatigue</li> <li>Orthostatic hypotension</li> <li>Diarr</li> <li>Rena</li> <li>Rena</li> <li>Rena</li> <li>Rena</li> <li>Rena</li> <li>Rena</li> <li>Coug</li> </ul>	hea Il impairment er respiratory s oneurotic ede Jh	symptoms ma

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 23.

Table 9. ACEI Alt	ternative 1: Angiotensin Receptor Blockers (ARBs)
Indications/Key	• May be considered as an alternative when ACE inhibitor results
Points	in significant cough (seen in less than 10%), or rash.
	Have been proven to improve symptoms, decrease hospital
	readmissions, and decrease mortality in patients in heart failure.
	However, in clinical trials ACE inhibitors remain superior for
	treatment of heart failure.
	<ul> <li>Therapy should continue for life.</li> </ul>

NOTE:CHF studies dose Valsarton twice daily, Candesartan daily. At target doses, Losartan was shown to be non-inferior to Candasartan.

Medications	Initiation/Titration	Target Dose	Maximum daily dose
losartan (Cozaar)	Start at target dose. If volume depletion or history of hepatic impairment, start with 50 mg daily.	100 mg daily	100 mg
valsartan (Diovan)	Start at 40 mg BID.	80-160 mg BID	320 mg
candesartan (Atacand)	Start at 16 mg daily.	32 mg daily	32 mg
Monitoring/ Labs	<ul> <li>Monitor blood pressure with initiation and titration of drug.</li> <li>Basic Metabolic Panel (BMP) weekly until target dose achieved.</li> <li>Monitor for elevations in potassium (greater than 5.0) and decrease potassium supplementation (if applicable), or modify target.</li> </ul>		
Contraindications	ACEI-induced angioedema	a	
Precautions	<ul><li>Renal impairment</li><li>Renal artery stenosis</li></ul>		
Adverse Reactions	• Dizziness • Hyperkalemia	Elevated cr	eatinine

Table 10. ACEI Al	ternative 2: Direct-ad	ting Vasodilat	ors
Indications/Key points	<ul> <li>May be considered when symptomatic hypotension, azotemia, or hyperkalemia results from use of an ACE inhibitor or ARB.</li> <li>Therapy should continue for life.</li> <li>Also demonstrated of value in addition to ACEI in African American population.</li> </ul>		
Medications *=generic available	Initiation/Titration	Target Dose	Maximum daily dose
*isosorbide dinitrate (Isordil NF, Sorbitrate NF)	Start at 10 mg tid	40 mg tid	240 mg
HCI (Apresoline)	Start at 10 mg tid	75 mg tid	300 mg
Monitoring/Labs	<ul> <li>Monitor blood pressure with initiation and titration of drug.</li> <li>Obtain CBC monthly.</li> <li>ANA titer.</li> <li>If hypotension impedes titration, increase either isosorbide dinitrate or hydralazine. In most cases, an increase in isosorbid is proforred over hydralazine, particularly if anging is a concern.</li> </ul>		
Contraindications	Isosorbide dinitrate: •None	Hydralazine • Active isch	: iemia
Precautions	Isosorbide dinitrate:Hydralazine:•Hypotension•Severe renal impairment•Volume depletion•Stroke•Hypertrophic•Aortic aneurysm•ardiomyopathy•Aspirin hypersensitivity		: nal impairment urysm persensitivity
Adverse Reactions	Isosorbide dinitrate: • Headache • Flushing • Dizziness • Weakness • Orthostatic hypotensi • Paradoxical bradycard • Rash	Hydralazine • Lupus-like with doses • Tachycard • Angina on • Headache dia • Edema • Orthostati • Peripheral • Flushing • GI disturba • Nasal cong • Lacrimatic • Rash • Blood dys	: reaction (more often greater than 200 mg/day) ia c hypotension neuritis ances gestion in

Table 11. Beta	Blockers		
Indications/Key Points	<ul> <li>Block neurohormonal effects of the sympathetic nervous system.</li> <li>Can increase survival when they are added to ACE inhibitor therapy. Have been shown to bring similar reductions in sudden cardiac death and death from worsening heart failure.</li> <li>Have been proven to improve symptoms, decrease hospital readmissions, improve cardiac EF, and decrease mortality.</li> <li>Do not initiate beta blockers for patients with acute heart failure, regardless of NYHA class, until they are clinically stabilized for at least 2-4 weeks (euvolemic with a systolic BP greater than 90 mm Hg and HR greater than 55 beats/minute) and only after they have been educated on the side effects of the medication. Prior to titration, patient must continue to meet these eligibility criteria.</li> <li>A low dose should be started at clinic visit and slowly titrated to target dose. Specialty referral for initiation and titration may be used.</li> <li>Therapy should continue for life.</li> </ul>		
Medications	Initiation/Titration	Target Dose         Maximum daily dose	
carvedilol (Coreg)	Start at 3.125 mg bid (first dose reactions include hypotension and/or bradycardia); double dose every 2 weeks until at target dose.	Patients less than 85 kg <b>:</b> 50 mg Patients greater than 85 kg <b>:</b> 100 mg	
metoprolol succinate (Toprol XL)	Start at 25 mg daily; double dose every 2 weeks until at target dose.	200 mg	
Monitoring/ Labs	<ul> <li>After patient has reached target maintained dose for 2-3 months evaluation of improvement of LV</li> <li>Monitor serial renal function test decreased cardiac output.</li> </ul>	target dose or maximally tolerated dose and nonths, patient should have a repeat echo for nt of LV function. on tests, as worsened function may indicate	
Contraindication	<ul><li>1st degree heart block</li><li>Cardiogenic shock</li></ul>	•Decompensated heart failure	
Precautions	<ul> <li>Avoid abrupt cessation</li> <li>Use with caution in patients with</li> <li>Sinus bradycardia (HR less than 55)</li> <li>Hypotension (systolic BP less than 90 mm Hg)</li> <li>Decompensated heart failure</li> </ul>	th any of the following: an •Hepatic dysfunction •Surgery •Diabetes •Hyperthyroidism	
Adverse Reactions	•Fatigue •Dyspnea •Dizziness •Bradycardia •Rash •Cold •Depression extremities •Glupset •Palpitations	•Heart Failure     •Hypotension     •Edema     •Syncope     •Chest pain     •Chest pain	

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Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 26.

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Table 12. Diure	tics		
Indications/ Key Points	<ul> <li>Diuretics should be used to maintain appropriate total body salt and water homeostasis only after proper sodium and fluid restriction instruction has been given.</li> <li>Diuresis should be started either in conjunction with or after afterload reduction therapy.</li> </ul>		
Medications *=generic available	Initiation/Titration	Target Dose	Maximum daily dose
1. Loop diuretics a	are generally recomme	nded to begin diuresis	5.
*furosemide (Lasix) ORAL/IV	Start with 10 - 40 mg daily but may increase as needed. (Scored tab sizes 20 mg, 40 mg, 80 mg)	Use physical signs (e.g., dependent edema, jugular venous pressure, and orthostatic	480 mg in single or divided doses
*bumetanide (Bumex) ORAL/IV/IM	Start with 0.5 - 1 mg daily but may increase as needed. (Scored tab sizes 0.5 mg, 1 mg, 2 mg)	blood pressure measurements) and laboratory findings (e.g., serum sodium,	10 mg in single or divided doses
*torsemide (Demadex) ORAL/IV	Start at 5 mg daily but may increase as needed. (Scored tab sizes 5 mg, 10 mg, 20 mg, 100 mg)	BUN and creatinine) to determine when the patient has reached appropriate sodium and water homeostasis.	200 mg in single or divided doses
2. If resistance to diuresis develops, or patient continues gaining weight after being placed on moderate to high doses of loop diuretics, try to change to a different loop diuretic or add:			
*metolazone (Zaroxolyn) ORAL	Start 2.5 mg daily but may increase as needed. (Tab sizes 2.8 mg, 5 mg, 10 mg)	5	20 mg daily in single or divided doses

Monitoring/ Labs Contraindications Precautions	<ul> <li>Monitor Basic Metabolic Panel (BMP) weekly until stable, and then every three months or as needed. Observe for abnormalities in entire panel.</li> <li>If K+ is less than 4.0, supplementation is recommended (see Potassium, next page).</li> <li>Anuria</li> <li>Hepatic coma or precoma</li> <li>For metolazone: sulfonamide allergy</li> <li>Renal and hepatic</li> <li>SLE</li> <li>dysfunction</li> <li>Diabetes</li> </ul>		
	Gout     Arrvthmias		
Adverse Reactions	<ul> <li>Loop diuretics:</li> <li>Excessive diuresis</li> <li>Fluid or electrolyte imbalance</li> <li>Gl upset</li> <li>Dizziness</li> <li>Vertigo</li> <li>Paresthesias</li> <li>Orthostatic hypotension</li> <li>Hyperglycemia</li> <li>Syncope</li> </ul>	<ul> <li>Jaundice</li> <li>Hyperuricemia</li> <li>Rash</li> <li>Photosensitivity</li> <li>Tinnitus or hearing loss</li> <li>Blood dyscrasias</li> <li>Metolazone:</li> <li>Electrolyte/ metabolic disturbances (especially hypokalemia)</li> </ul>	<ul> <li>Hyperglycemia</li> <li>Hyperuricemia</li> <li>Hypercalcemia</li> <li>Orthostatic hypotension</li> <li>Photosensitivity</li> <li>Gl disturbances</li> <li>Blood dyscrasias</li> <li>Chest or joint pain</li> <li>Cutaneous vasculitis</li> </ul>
Patient Education	<ul> <li>After patients have weigh themselves of pounds within a 24- weight may be an in diuretic dose. Patie be appropriate for s Diuretic Titration.</li> <li>Continue ongoing p high-potassium foo of hypo/hypervoler prescribed, what to reportable symptor</li> </ul>	reached a euvolemic s daily and keep a log. Ar -hour period or 5 poun ndication to supplemer nt self-management o select patients. See Ap patient education relate ods, fluid restrictions, si nia, importance of taki do if a dose is missed, ns.	state, they should n increase of 2 nds above target nt the routine f diuretics may pendix B, Flexible ed to: high-sodium or gns and symptoms ng medication as precautions, and

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 27.

Table 13. Potass	ium		
Indications/ Key Points	<ul> <li>Used to correct hypokalemia in patients who are chronically treated with non-potassium sparing diuretics. Decreased potassium levels (K+ less than 4.0) may precipitate potentially hazardous ventricular arrhythmias, even in patients without a prior history.</li> <li>Hypokalemia may also be responsible for the worsening of insulin resistance, the loss of carbohydrate tolerance, and the rise in plasma lipids seen with diuretic use.</li> <li>In patients with renal failure, or patients treated with ACE inhibitors or NSAIDS, there is a greater risk of hyperkalemia (K+ greater than 5.0) if K+ sparing diuretics are used.</li> </ul>		
Medications *=generic available	Initiation/Titration	Target Dose	Maximum Dose
*potassium chloride (K-Dur, Klor- Con)	Start at 10 mEq daily. Increase dose until serum K+ remains within normal levels (4.0 - 5.0). May take in divided doses as necessary.	Depends on the patient's renal function, whether they are on an ACE inhibitor, and the type of diuretic used.	
Monitoring/ Labs	Monitor Basic Metabolic Par every 3 months (goal K+ ber	nel (BMP) weekl tween 4.0 - 5.0).	y until stable, then
Contraindications	<ul> <li>Hyperkalemia (K+</li> <li>Heat greater than 5.0)</li> <li>Chronic renal disease</li> <li>Acute dehydration</li> <li>Adu</li> </ul>	at cramps vere tissue struction renal insufficienc	• Acidosis • Alkalosis
Precautions	<ul> <li>Discontinue if GI bleed, ulceration, or renal disease.</li> <li>Monitor potassium level, clinical status, acid-base balance, and EKG.</li> </ul>		
Adverse Reactions	<ul> <li>Hyperkalemia</li> <li>GI discomfort and irritation</li> <li>Diarrhea</li> <li>Rash</li> </ul>		
If hyperkalemia is present, consider:	<ul> <li>Discontinue or decrease potassium supplementation by 50%, do not restart potassium until K+ less than 4.5.</li> <li>Consider ACE inhibitor induced hyperkalemia after potassium supplements have been held. May need to consider decreasing dose of ACE inhibitor.</li> <li>If using potassium-sparing diuretics, change to or increase loop diuratic if additional diuracis is pooded.</li> </ul>		

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 28.

Table 14. Digox	Table 14. Digoxin			
Indications/Key Points	<ul> <li>Has been shown to improve patients with NYHA Class II</li> <li>Also used in patients with a</li> </ul>	e symptoms an I/IV heart failur trial fibrillation.	d decrease hospitalizations in e or ACC/AHA Stage C or D.	
Medications *=generic available	Initiation/Titration	Target Dose	Maximum daily dose	
*digoxin (Lanoxin)	<ul> <li>Start dose at 0.125 mg or less daily for all patients.</li> <li>Adjust dose to a level of less than 1.0</li> <li>No need to give loading dose when indication is HF.</li> </ul>	Therapeutic level is less than 1.0	<ul> <li>No more than 0.125 mg for patients greater than 65 years</li> <li>Decrease dose if level greater than 1.2</li> </ul>	
Monitoring/ Labs	<ul> <li>Obtain digoxin level after 7 days of therapy. Follow digoxin level at least every 4 months, unless there is a change in renal or GI function, in which case digoxin level should be checked much more frequently. Decrease dose if level greater than 1.2.</li> <li>Must adjust dose in the setting of significant renal insufficiency (creatining greater than 2.0 - 2.5).</li> </ul>			
Contraindications	History of ventricular fibrilla	tion		
Precautions	<ul> <li>Renal dysfunction (decrease dose)</li> <li>Electrical cardioversion</li> <li>Acute MI</li> <li>Idiopathic hypertrophic subaortic stenosis</li> <li>Toxicity risk increased by hypokalemia, hypomagnesemia, &amp; hypercalcemia</li> </ul>			
Adverse Reactions	<ul> <li>Heart block and other arrhythmias</li> <li>GI effects (anorexia, nausea, vomiting, diarrhea)</li> <li>CNS effects (visual or mental disturbances, confusion, headache, weakness, dizziness, apathy)</li> </ul>			
Drug Interactions	<ul> <li>Toxicity risk is increased by potassium-depleting drugs (e.g., diuretics, amphotericin B, corticosteroids).</li> <li>Digoxin levels are increased by antibiotics, amiodarone, propafenone, felodipine, quinidine, verapamil, indomethacin, itraconazole, alprazolam, spirinolactone, drugs that reduce GI motility (propantheline, diphenoxylate), thyroid antagonists, and drugs that reduce renal function.</li> <li>Digoxin levels are decreased by thyroid hormones, antacids, kaolin-pectin, cholestyramine, rifampin, sulfasalazine, neomycin, drugs that increase GI motility (metoclopramide), and some antineoplastics.</li> <li>Digoxin levels are possibly affected by quinine, penicillamine.</li> <li>Arrhythmias may occur with sympathomimetics, succinylcholine, or rapid calcium infusion.</li> </ul>			

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Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 29.

Table 15. Spiron	Table 15. Spironolactone				
Indications/	• Used in patients in N	IYHA Class	III-IV symptor	ms.	
Key Points	<ul> <li>Shown in studies to present the studies of the studie</li></ul>	prolong life	and improve	symptoms.	
Medications *=generic available	Initiation/Titration Target Maximum da Dose dose				
*spironolactone (Aldactone)	Start at target dose of daily. May decrease to 12.5 if not tolerated at targe if there is persistent el potassium levels.	25 mg mg daily et dose, or levation in	25 mg daily	100 mg	
Monitoring/ Labs	<ul> <li>Monitor serum potassium values weekly, assessing for the presence of hyperkalemia until stable; and then monthly for three months; then every 3 months until stable.</li> <li>If the serum potassium concentration increases to greater than 5.5 mmol/L at any time, suggest reducing the spironolactone dosage to 12.5 mg daily and reevaluating the patient's response after 1 week.</li> <li>If the serum potassium values remain stable over 8 weeks, and the patient shows evidence of progression of heart failure, increase the dosage to 50 mg bid and continue to monitor the patient's serum potassium levels.</li> <li>The patient's serum potassium level should also be rechecked during any exacerbation of symptoms of heart failure (because of deteriorating renal failure). This deteriorating renal function</li> </ul>				
Contraindications	<ul> <li>Significant hyperkalemia (K+ greater than 5.5)</li> <li>Renal impairment (creatinine greater 3.0)</li> </ul>				
Precautions	• Hyponatremia				
Adverse	•Hyperkalemia	<ul> <li>Drowsines</li> </ul>	ss •Dru	g fever	
Reactions	• Hyponatremia	•Headache	• Ata	xia	
	• Gynecomastia	Rash	• Imp	otence	
	• GI disturbances	<ul> <li>Confusion</li> </ul>	• Hirs	sutism	
			• Voic	ce deepening	

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Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 30.

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Table 16. Nitrates			
Indications	Used for chest pain/angina		
Medications *=generic available	Dosage Notes		
*isosorbide dinitrate (Isordil, Sorbitrate)	<ul> <li>Angina prophylaxis:</li> <li>5 - 40 mg oral tid (5, 10, 20, 30, and 40 mg tabs)</li> <li>Acute angina attack:</li> <li>Sublingual tabs: 1 every 5 - 10 mins prn, up to 3 doses in 30 minutes (2.5, 5, 10 mg tabs)</li> <li>Sustained release (Isordil Tembids, Dilatrate SR): 40-80 mg oral bid (40 mg tabs)</li> </ul>		
*isosorbide mononitrate (ISMO, Monoket, Imdur)	<ul> <li>ISMO or Monoket: 20 mg oral twice daily (ISMO 20 mg tabs, Monoket 10, 20 mg tabs)</li> <li>Extended-release (Imdur): Start 30-60 mg oral daily, maximum 240 mg daily (30, 60, 120 mg tabs)</li> </ul>		
*nitroglycerin, ointment (Nitro-bid, Nitrol)	Start 0.5 inch every 8 hours, maintenance 1-2 inches every hour, maximum 4 inches every 4-6 hours (15 mg/ inch [2%])		
*nitroglycerin, sublingual (Nitrostat)	0.4 mg sublingual every 5 minutes as needed up to 3 doses in 15 minutes (0.3, 0.4, 0.6 mg)		
*nitroglycerin, sustained release (Nitrong, Nitroglyn)	Start 2.5 or 2.6 mg oral bid or tid, then titrate upward as needed (Nitrong 2.6, 6.5, 9 mg; Nitroglyn 2.5, 6.5, 9, 13.5 mg)		
*nitroglycerin, transdermal	1 patch 12-14 hours each day. Doses in mg/hour: Deponit 0.2, 0.4; Minitran 0.1, 0.2, 0.4, 0.6; Nitro-Dur 0.1, 0.2, 0.3, 0.4, 0.6, 0.8; Nitrodisc 0.2, 0.3, 0.4; Transderm- Nitro 0.1, 0.2, 0.4, 0.6, 0.8		
Precautions	Acute MI     Hypotension     Volume depletion     Narrow angle glaucoma		
Adverse Reactions	Headache     Nausea     Tachycardia     Dizziness     Rash     Orthostatic hypotension     Orthostatic hypotension		
Patient Education	Instruct patient to notify provider if any of the following present after use of nitrates: • Recurrent/unrelieved chest pain • Increased severity of chest pain (on scale from 1-10) • Change in baseline vital signs • Alteration in LOC or mentation		

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 32.

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Table 17. Warfa	rin		
Indication/Key Points	<ul> <li>Should be used in patients with atrial fibrillation. (Atrial fibrillation is the most common cardiac arrhythmia seen in clinical practice, affecting an estimated 1 million persons in the U.S. The attributable risk of stroke from atrial fibrillation is estimated to be 1.5% for those aged 50-59 and approaches 30% for those aged 80-89.)</li> <li>Should also be considered in patients with a low EF (less than 25%) and intracardiac thrombi or a previous history of systemic or pulmonary embolism.</li> <li>There is decreasing support in the literature for use of warfarin in patients with low EF and no atrial fibrillation.</li> </ul>		
Medications *=generic available	Initiation/Titration	Target Dose	Maximum Dose
*warfarin (Coumadin)	Start at 2 mg dose daily in the evening and titrate according to INR (see Labs below).	Usual maintenance d daily.	oses 2 - 10 mg
Monitoring/ Labs	<ul> <li>Monitor PT/INR weekly until stable and adjust dose according to INR.</li> <li>Target INR 2.0 - 3.0 unless known prosthetic valve replacement, then target INR 2.5 - 3.5.</li> <li>Once stable, monitor monthly.</li> </ul>		
Contraindications	<ul> <li>Hemorrhagic conditions or treatments</li> <li>Malignant hypertension</li> <li>Blood dyscrasias</li> <li>Heparin-induced thrombocytopenia</li> </ul>	<ul> <li>Noncompliant patients</li> <li>High fall risk without supervision</li> <li>CNS, ophthalmic, or traumatic</li> <li>surgery</li> <li>Major regional lumbar block anesthesia</li> <li>Pregnancy</li> <li>Alcoholism</li> </ul>	
Precautions	<ul> <li>Hepatic or renal insufficiency</li> <li>Infection</li> <li>Trauma</li> <li>Diabetes</li> </ul>	<ul> <li>Edema</li> <li>Hyperlipidemia</li> <li>Thyroid disorders</li> <li>Collagen vascular dis</li> <li>Hypertension</li> </ul>	sease

Adverse Reactions	<ul> <li>Tissue or organ hemorrhage</li> <li>Hypersensitivity reactions</li> <li>Systemic cholesterol microembolization</li> <li>Purple toes syndrome</li> </ul>	<ul> <li>Hepatic disorders</li> <li>Dermatitis</li> <li>Urticaria</li> <li>Abdominal pain</li> <li>Asthenia</li> <li>Gl upset</li> <li>Skin / tissue necrosis</li> </ul>	<ul> <li>Headache</li> <li>Pruritus</li> <li>Alopecia</li> <li>Paresthesias</li> <li>Fever</li> <li>Vasculitis</li> </ul>
Drug Interactions	<ul> <li>Warfarin is potentiated lacetaminophen, antibic steroids, flu vaccines, vi</li> <li>Bleeding may occur wit procoagulation factor ir</li> <li>Warfarin is antagonized inhibitors, drugs that inchibitors, drugs that inchibitors, drugs that inchibitors, urokinas</li> <li>Warfarin potentiates hy streptokinase, urokinas</li> <li>Use caution with drugs NSAIDS, aspirin).</li> </ul>	by plasma protein bound tics, hepatic enzyme inhi tamin K deficiency, and t h platelet aggregation in hibitors. by hepatic enzyme induc crease procoagulant facto poglycemics, anticonvuls e, other fibrinolytics. that may cause hemorrh	drugs, bitors, anabolic hyroid drugs. hibitors or cers, absorption ors, and diets sants, age (e.g.,

Intermountain Health Care Clinical Education Services (2003), Management of Heart Failure, p. 31.

Table 18. Oral D	Table 18. Oral Direct Thrombin Inhibitors (Dabigatran and Rivaroxaban)				
Indication/Key Points	<ul> <li>Should be used in patients with non-valvular atrial fibrillation. (Atrial fibrillation is the most common cardiac arrhythmia seen in clinical practice, affecting an estimated 1 million persons in the U.S. The attributable risk of stroke from atrial fibrillation is estimated to be 1.5% for those aged 50-59 and approaches 30% for those aged 80-89.)</li> <li>Major side effect is bleeding. Patients must be routinely monitored even though INR levels are not required. It has been suggested that at least quarterly evaluation should be done to assess for bleeding, medication compliance, other medication reviewed, and renal function</li> <li>Use warfarin for HF patients with CrCl less than 30 ml/min (<i>do not use dabigatran or rivaroxaban, if CrCl less than 30ml/min</i>)</li> </ul>				
Medications (generic not available)	Initiation/Titration	Target Dose			
Pradaxa (Dabigatran etexilate mesylate)	•150mg PO BID •75mg PO BID if CrCl between 15-30ml/min	Same			
Xarelto (Rivaroxaban)	<ul> <li>•20 mg daily with evening meal</li> <li>•15 mg daily with evening meal if CrCl between</li> <li>15-50 ml/min</li> <li>•Avoid if CrCl less than 15 ml/min</li> </ul>	Same			
Monitoring/ Labs	•Lab monitoring (INR) is not required, but quarterl renal function is recommended	y evaluation of			
Contraindications	<ul> <li>Hemorrhagic conditions</li> <li>Anaphylactic reactions to dabigatran or rivaroxaban</li> <li>Noncompliant patients</li> <li>Any patient being con anticoagulation thera described above in Ta</li> </ul>	nsidered for apy. They are able 16 –			
Precautions	<ul> <li>Use not recommended in dialysis patients or with CrCl less than 15ml/min</li> <li>Pregnancy category C</li> <li>Stop 1-2 days before CrCl greater than 500</li> <li>Stop 3-5 days before CrCl less than 50ml/</li> </ul>	e surgery if ml/min e surgery if min			
Adverse Reactions	<ul> <li>Dyspepsia and gastritis-like symptoms</li> <li>GERD, esophagitis, erosive gastritis</li> <li>Gastric hemorrhage / hemorrhagic gastritis, and (</li> </ul>	Glulcer			
Drug Interactions	<ul> <li>Avoid Rifampin with dabigatran</li> <li>Dronedarone and systemic ketoconazole in patients renal impairment (CrCl 30-50 ml/min): Consider red dabigatran dose to 75 mg twice daily</li> <li>Do not use dabigatran concurrently with dronedaror ketoconazone, if the CrCl is less than 30ml/min</li> <li>Use caution with drugs that may cause hemorrhage</li> </ul>	with moderate ducing ne and (NSAID, ASA)			

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Table 19. Statins						
Indication	•Secondary prevention of cardiovascular disease with LDL goal less than 100 (option of 70 as goal)					
Monitoring/ Labs	•Lipid levels after 4 •CPK with symptom	– 6 weeks ns suggestive of myor	oathy			
Contraindications	Hypersensitivity to a statin component     Pregnancy     Active liver disease     Breast feeding					
Precautions	Rhabdomyolysis     Rule out secondary causes of hyperlipidemia					
Adverse Reactions	Gastrointestinal     Oiarrhea     Arthralgia     Nasopharyngitis     Confusion or decreased mental capabilities					
Drug/Food interactions	<ul> <li>Avoid Silodosin, topotecan</li> <li>Increased effect by statin: aliskarin, daptomycin, digoxin, diltiazem, everolimus, midazolam, rivaroxaban, trabecedin, verapamil</li> <li>Increased level of statin: antifungal agents, CYP3A4 inhibitors</li> <li>Statins may decrease the effect of dabigatrin</li> <li>Avoid excessive alcohol use, large quantities of grapefruit juice, St. John's wart</li> </ul>					

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Table 20. Relative LDL-lowering Efficacy of Statin Therapies									
Atorva-	Fluva-	Pitava-	Lova-	Prava-	Rosuva-	Simva-	% reduction LDL-C		
	40 mg	1 mg	20 mg	20 mg		10 mg	30 %		
10 mg	80 mg	2 mg	40 mg	40 mg		20 mg	38 %		
20 mg		4 mg	80 mg	80 mg	5 mg	40 mg	41 %		
40 mg					10 mg		47%		
80 mg					20 mg		55%		
					40 mg		63%		

Atorva=Atorvastatin; Fluva=Fluvastatin; Pitava=Pitavastatin; Lova=Lovastatin; Prava=Pravastatin; Rosuva=Rosuvastatin; Simva=Simvastatin.

(Data from US Food & Drug Administration, June 8, 2011. Available at: http://www.fda.gov/Drugs/DrugSafety/ucm256581.htm)

### N. Recommendations for Admission

Table 21. Recommendations for Hospitalizing Patients Presenting With           Acute Decompensated Heart Failure						
Recommendation	Clinical Circumstances					
Hospitalization Recommended	<ul> <li>Evidence of severe ADHF, including: Hypotension Worsening renal function Altered mentation</li> <li>Dyspnea at rest Typically reflected by resting tachypnea Less commonly reflected by oxygen saturation less than 90%</li> <li>Hemodynamically significant arrhythmia Including new onset of rapid atrial fibrillation</li> <li>Acute coronary syndromes</li> </ul>					
Hospitalization Should Be Considered	<ul> <li>Worsened congestion Even without dyspnea</li> <li>Signs and symptoms of pulmonary or systemic congestion Even in the absence of weight gain</li> <li>Major electrolyte disturbance</li> <li>Associated comorbid conditions Pneumonia Pulmonary embolus Diabetic ketoacidosis Symptoms suggestive of transient ischemic accident or stroke</li> <li>Repeated ICD firings</li> <li>Previously undiagnosed HF with signs and symptoms of systemic or pulmonary congestion</li> </ul>					

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 498.

### O. Discharge Criteria

Table 22. Discharge Criteria for Patients With HF				
Recommended for all HF patients	<ul> <li>Exacerbating factors addressed.</li> <li>Near optimal volume status observed.</li> <li>Transition from intravenous to oral diuretic successfully completed.</li> <li>Patient and family education completed, including clear discharge instructions.</li> <li>LVEF documented.</li> <li>Smoking cessation counseling initiated.</li> <li>Near optimal pharmacologic therapy achieved, including ACE inhibitor and beta blocker (for patients with reduced LVEF), or intolerance documented (Sections 7 and 11).</li> <li>Follow-up appointment scheduled in 2 days (high risk for readmission*) or 5 days (moderate risk for readmission*)</li> </ul>			
Should be considered for patients with advanced HF or recurrent admissions for HF	<ul> <li>Oral medication regimen stable for 24 hours.</li> <li>No intravenous vasodilator or inotropic agent for 24 hours.</li> <li>Ambulation before discharge to assess functional capacity after therapy.</li> <li>Plans for post discharge management (scale present in home, visiting nurse or telephone follow up generally no longer than 3 days after discharge).</li> <li>Referral for disease management, if available.</li> </ul>			

\*High risk for readmission—2 or more readmissions in previous year. Moderate risk for readmission—1 readmission in previous year.

Lindenfeld J. et al, (2010), Executive Summary: HFSA 2010 Comprehensive Heart Failure Practice Guideline. Journal of Cardiac Failure, 16(6): 500.

#### Table 23. Criteria for discharge after emergency department treatment

- 1. Heart Failure is a known diagnosis for the patient.
- 2. The patient has adequate social support (living alone does not necessarily mean inadequate social support).
- 3. The patient responds appropriately to the therapy in the emergency department:
  - a. Supplemental oxygen needs are at baseline
  - b. No resting tachypnea or resting tachycardia (excluding tachycardia due to treatment with albuterol and similar agents)
  - c. Systolic blood pressure is greater than 90 mmHg
- 4. The patient has access to close outpatient follow up with a primary care provider or a cardiologist.

### P. Advanced Care Planning and Palliative Medicine

- By virtue of their close professional relationship with their patients, primary care providers and cardiologists are optimally positioned to provide basic advanced care planning (also referred to as Primary Palliative Care) for their patients. ANY ONE OF THE FOLLOWING may be potential triggers for a Primary Palliative Care discussion with your patient:
  - a. Patient request, regardless of HF stage, class, or functional status
  - b. Your answer is 'no' in response to the following question: "Would you be surprised if this patient died in the next 6 12 months?"
     If you would not be surprised that the patient died in the next 6-12 months, our responsibility and obligation is to make certain that the patient and family would not be surprised, either.
  - c. More than two hospitalizations for HF in the past year (more than one if patient over 85 years old).
  - d. Marked functional impairment (ie: NYHA class IV or ACC/AHA class D).
  - e. EF less than or equal to 20% (although a patient with EF greater than or equal to 20% may be end-stage and should not be excluded from the offer of palliative care).
  - f. Worsening condition or progressive symptoms that appears to be irreversible.
  - g. Patient does NOT desire readmission and ongoing "aggressive" interventions.
  - h. Six minute walk test result is less than 300 meters (due to cardiac etiology).
- 2. There may be a role for Secondary Palliative Medicine Consultation if:
  - a. Your patient requires additional advanced care planning.
  - b. You and/or your patient desire recommendations to match treatment to goals of care.
  - c. Your patient would benefit from more symptom management explanation, personal support, or understanding of community resource options.
- 3. Secondary Palliative Medicine consultation is currently only available to inpatients and heart failure clinic patients.
  - a. Hospitalists or HF clinic providers: If you are considering secondary Palliative Medicine consultation, please first notify and discuss your intention with the patient's primary care provider and/or cardiologist before placing an order for consultation in EPIC (an order is required).
  - b. Ambulatory providers: If you desire assistance for palliative conversations with a patient, please request a Palliative/Hospice referral by calling MultiCare.Good Samaritan Home Health and Hospice at 888.516.4504 or 253.301.6400 OR send order to Home Health via EPIC and specify need for Palliative Medicine.

### **Q. Advanced Treatment**

- 1. Aquaphoresis (may be required for severe volume overload poorly responsive to diuretics this therapy is most effective when started at the time of admission)
  - a. Aquapheresis is removal of excess fluid using extracorporeal therapy.
  - b. Patient selection: Fluid overload and those who have failed diuretic therapy.
  - c. Goal: Remove 80% of the estimated weight over dry weight. Example: If a patient is 10 pounds over his dry weight, the goal of fluid removal should be 8 pounds or 3.6L in 24 hours (2.2 pounds = 1kg = 1Liter)
  - d. Requirements: A PICC or a central line is required to initiate Aquapheresis. Intravenous Heparin (or other anticoagulants if Heparin is contraindicated) is required during the process. Low molecular weight heparin is not recommended.
  - e. How much fluid removal should be prescribed? 250ml/hour is appropriate for most patients. A few volume sensitive patients (i.e. with right heart failure, cardiogenic shock or with severe hepatic disease) may need lower removal rates of 50-150ml/hour.
  - f. How long the treatment should be continued? Average therapy lasts 24 hours. It may be continued for 48 hours on a case by case basis.
- 2. Inotropic Therapy severely decreased cardiac output
  - a. Milrinone
  - b. Dobutamine
  - 3. Electrophysiology
  - a. Atrial arrhythmia ablation
  - b. Ventricular arrhythmia ablation
  - c. AICD Automatic Implanted Cardiac Defibrillator
  - d. CRT-D Cardiac Resynchronization Therapy Defibrillator
  - e. EF less than or equal to 35%
  - f. Wearable Cardioverter-Defibrillator
- 4. VAD Ventricular Assist Device
  - a. Severe, intractable LV dysfunction
  - b. Destination Therapy
  - c. Pre-transplant

Table 24. Indications for Ventricular Assist Device Implant						
Bridge to transplantation	<ul> <li>Patient listed for transplant with severe hemodynamic compromise that is unlikely to survive without mechanically assisted circulation</li> </ul>					
Destination Therapy	• Patient with heart failure refractory to medical management but who is ineligible for transplant (most commonly older age, renal dysfunction, pulmonary hypertension, and high body mass index)					
Bridge to recovery/ decision	<ul> <li>Patient with a potentially reversible cardiomyopathy requiring imminent mechanical support of candidacy for transplant cannot be determined at the time that a decision about ventricular assist device implant must be made</li> </ul>					

Khazanie, P. and Rogers, J. G. (2011), Patient Selection for Left Ventricular Assist Devices. Congestive Heart Failure, 17: 227–234. doi: 10.1111/j.1751-7133.2011.00236.x

Table 25. INTERMACS Heart Failure Classification					
Level 1	Critical cardiogenic shock ("crashing and burning")				
Level 2	Progressive decline on inotropic support				
Level 3	Stable but inotrope dependent				
Level 4	Resting symptoms on home oral therapy				
Level 5	Exertion intolerant				
Level 6	Exertion limited				
Level 7	Advanced NYHA functional class III				
Abbreviations: INTERMACS, Interagency Registry for Mechanically Assisted					
Circulatory Support; NYHA, New York Heart Association					

Khazanie, P. and Rogers, J. G. (2011), Patient Selection for Left Ventricular Assist Devices. Congestive Heart Failure, 17: 227–234. doi: 10.1111/j.1751-7133.2011.00236.x

Table 26. Indications and Contraindications for Left Ventricular AssistDevice Placement						
Indications	<ul> <li>New York Heart Association functional class IV heart failure</li> <li>Left ventricular ejection fraction less than 25%</li> <li>Failure to respond to optimal medical management for at least 45 of the past 60 days</li> <li>Intra-aortic balloon pump-dependent for 7 days</li> <li>Intravenous inotrope-dependent for 14 days</li> <li>Functional limitation – peak oxygen consumption 14 ml/kg/min</li> </ul>					
Relative Contraindications	<ul> <li>Morbid obesity</li> <li>Small body (body surface area less than 1.5 m<sup>2</sup>)</li> <li>Chronic renal dysfunction but not dialysis-dependent</li> <li>Mild-moderate liver dysfunction</li> <li>Malnutrition</li> <li>Severe untreated mitral stenosis and aortic regurgitation</li> </ul>					
Contraindications	<ul> <li>Sepsis or current active infection</li> <li>Severe right heart failure</li> <li>Untreated, severe carotid artery disease</li> <li>Severe obstructive/restrictive pulmonary disease</li> <li>Irreversible severe cerebral injury</li> <li>Dialysis-dependent renal failure</li> <li>Elevated international normalized ratio from liver failure or disseminated intravascular coagulation</li> <li>Any severe end-organ failure</li> <li>Heart failure that is expected to recover without mechanical circulatory support</li> <li>Noncardiac illness likely to limit survival to less than 2 years</li> </ul>					

Khazanie, P. and Rogers, J. G. (2011), Patient Selection for Left Ventricular Assist Devices. Congestive Heart Failure, 17: 227–234. doi: 10.1111/j.1751-7133.2011.00236.x

5. Cardiac Transplantation (Referral): Per criteria

### **R. Hospice referral**

#### 1. Disease-specific guidelines:

Patients will be considered to be in the terminal stage of heart disease (life expectancy of six months or less) if they meet the following criteria. (1 and 2 should be present. Factors from 3 will add supporting documentation):

- a. At the time of initial certification or recertification for hospice, the patient is or has been already optimally treated for heart disease. S/he is not a candidate for surgical procedures or has declined those procedures. (Optimally treated means that the patient who is not on vasodilators has a medical reason for refusing these drugs, e.g., hypotension or renal disease.)
- b. The patient is classified as New York Heart Association (NYHA) Class IV and may have significant symptoms of heart failure or angina at rest. (Class IV patients with heart disease have an inability to carry on any physical activity without discomfort. Symptoms of heart failure or of anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased.) Significant congestive heart failure may be documented by an ejection fraction of less than or equal to 20%, but is not required if not already available.
- c. Documentation of the following factors will support but are not required to establish eligibility for hospice care:
  - 1) Treatment resistant symptomatic supraventricular or ventricular arrhythmias;
  - 2) History of cardiac arrest or resuscitation;
  - 3) History of unexplained syncope;
  - 4) Brain embolism of cardiac origin;
  - 5) Concomitant HIV disease.

#### 2. Non-disease specific referral guidelines:

It is important to note that HF patients can qualify for Hospice even when they do not meet the traditional criteria outlined above. Please also consider the following criteria:

- a. Karnofsky Performance Status (http://www.npcrc.org/usr\_doc/adhoc/ functionalstatus/Karnofsky%20Performance%20Scale.pdf) or Palliative Performance Score (http://www.npcrc.org/usr\_doc/adhoc/functionalstatus/Palliative%20 Performance%20Scale%20(PPSv2).pdf) is less than 70%
- b. Dependence on assistance for 2 or more activities of daily living (ADLs)
- c. Co-morbidities: The presence of other chronic diseases with severity contributing to life expectancy of 6 months or less:
  - 1) Chronic obstructive pulmonary disease
  - 2) Diabetes mellitus
  - 4) Neurologic disease (CVA, ALS, MS, Parkinson's); Dementia
  - 5) Renal failure
  - 6) Liver Disease
  - 7) Neoplasia
  - 8) Acquired immune deficiency syndrome/HIV
  - 9) Refractory severe autoimmune disease (e.g. Lupus or Rheumatoid Arthritis)
  - 10) Ischemic heart disease

### S. Home Assistance

- 1. Contact Numbers
  - a. HF Clinic: 253.403.4590
  - b. After hours consulting nurse: 253.792.6300 (Backline for providers, only: 253.792.6314)
- 2. Home Health: 888.516.4504 or 253.301.6400
  - a. Nursing to provide skilled assessment in the home, assist with patient education related to ongoing disease management, adherence to medications and diet, and assessment and management of symptoms.
  - b. MSW to provide financial assistance to obtain mediations, transportation, and care giving resources. Note: MSW service is usually only available if home health nursing is also involved.
  - c. Telemonitoring: 253.301.6400
    - Available to patients followed by MMA providers OR organization wants patient seen for "cost avoidance," in order to reduce re-hospitalization events (Home health admitting nurse will also evaluate in-home safety to ensure that telemonitoring is appropriate).
    - 2) Includes daily monitoring with nursing response to changes in blood pressure, heart rate, weight, oxygen saturation.
      - a) Patients also respond to a menu of questions to more precisely indicate a worsening of his/her condition.
      - b) Routine bi-monthly report is sent to patient's PCP, and weekly reports are available upon request.
  - d. In-Home Palliative Medicine consultation/referral is available upon provider request. Please see section O for additional details.
- 3. Hospice:
  - a. Physical, psychosocial, and spiritual management for patients and their loved ones. Includes: Medical Director, Nursing, MSW, Chaplains, Aides, Volunteers, Comfort therapists (massage, Reiki, aromatherapy, pet therapy, music therapy).
  - b. Bereavement supports patient's family for 13 months following death.
- 4. Social Services:
  - a. Inpatient Social Work TGH/AH: 253.403.1126 (7AM 5PM)
  - b. Inpatient Social Work GSH: 253.697.1517
  - c. Laura Woods: (253.403.1126 established HF clinic patients, only)
- 5. Inpatient Care Management: 253.403.4951 (7 AM 5 PM)
- 6. PLU Heart Failure Community Transition Program: 253.403.4459

### T. Quality Monitoring / Core measures

The Heart Failure Collaborative oversees all quality improvement efforts. Those efforts include, but are not limited to:

- 1. Get with the Guidelines metrics: Please refer to the guidelines. (provide the guidelines in an appendix)
- 2. Readmission rates
- 3. Quality of life metrics
- 4. CMS Core measures metrics:

CMS metrics for inpatient care are as follows:

- 1. Evaluation of LV Function:
  - a. Method may be obtained from ECHO, Nuclear Scan, Cardiac Catheterization, etc., but it must be stated in the chart. It does not have to be a recent value, any value is sufficient, as long as documented.

Exclusions:

- a. LVAD placed on this admission
- b. Age less than 18
- c. Length of stay greater than 120 days
- d. Patient enrolled in clinical trial
- e. Patient left AMA
- f. Discharged to hospice care
- g. Comfort measures only
- ACEI or ARB for LVSD ordered at hospital discharge: Exclusions: Same as above including: If patient not prescribed either drug, the reason for not using ACEI or ARB must be documented.
- 3. Discharge Instructions: all of the elements listed below must be included in the discharge instructions
  - a. Recommended activity level
  - b. Diet
  - c. Discharge medications
  - d. Follow up appointment
  - e. Weight monitoring
  - f. What to do if symptoms worsen

Metrics for outpatient care:

- 1. 2012 Physician Quality Reporting metrics for heart failure:
  - a. Left Ventricular Ejection Fraction (LVEF) Assessment
  - b. Left Ventricular Function (LVF) Testing
  - c. Patient Education
  - d. Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)
  - e. Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for LVSD

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### Appendix A

#### Patient Action Plan

Follow up - Appointment within 48 or 72 hours after inpatient hospitalization. Date:\_\_\_\_\_



### Appendix B

#### Flexible Diuretic Dosing Guidelines for Management of Heart Failure

### Scope/Patient Population:

This can be utilized for adult patients with heart failure who have weight gain of 3 pounds overnight or 5 pounds in a week or less. In addition to weight gain, the patient may also exhibit increased shortness of breath with exertion, nocturnal dyspnea, orthopnea, increased ankle or lower extremity swelling, or abdominal bloating.

#### Policy Statement/Background:

For the appropriate patients, flexible diuretic guidelines can safely promote diuresis for patients to avoid hospital admissions, emergency department visits, and extra provider office visits.

These guidelines can be utilized by the physician for ambulatory patients or referred home health patients. They can be implemented through patient prescription, physician/pharmacist collaborative practice protocol, or by physician orders with home health.

#### Special Instructions:

Inclusion Criteria for ambulatory self-administration:

- 1. Patient is on optimal medical therapy for heart failure, or in the process of titration.
- 2. Patient is on a regular dose of diuretic, or not taking a diuretic.
- 3. Patient can identify correct medication and function as diuretic.
- 4. Able to monitor weight and symptoms, or has a caregiver who can do so.
- 5. Able to keep a diary, verbalize titration instruction, or have a caretaker to assist.
- 6. Patient is able to go to lab to have BMP drawn prior to and within one week after titration.

Exclusion Criteria: Referred home health patients do not need to meet the above criteria due to increased supervision with medications and lab draws.

#### Duration of therapy:

Patient may self administer, or through home health services, utilize the flexible diuretic protocol until weight returns to baseline, or up to three day maximum per episode. If weight has not returned to baseline at three days, the physician will need to be contacted for additional orders.

#### Procedure:

- I. Home Health Orders:
  - 1. Draw lab BMP within 3 to 5 calendar days of end of 3 day treatment regimen identified below (further adjustment to Potassium supplement will be based on these results).
  - 2. Draw lab BNP if not done 6-8 weeks prior to admission, then every 6-8 weeks thereafter.
  - 3. Telemonitor daily x one month.
  - 4. During 3 day treatment identified below: patient status will be assessed daily with either a visit or telephone.
  - 5. If symptoms improve to baseline after 3 days of treatment, then resume to previous diuretic dose.
  - 6. If symptoms do not improve, the physician will be called for further orders and/or to schedule patient appointment.
- II. THE FOLLOWING DOSING WILL BE USED UNLESS THE PHYSICIAN INDICATES OTHERWISE IN "OTHER" for Home Health: The same orders can be printed into the AVS for ambulatory patients.

Dosing times for twice daily dosing: morning and 12 noon.

A. Dose Adjustment of loop diuretic (furosemide/Lasix) :

#### Regular Dose ----- Adjusted Dose

- 20 mg daily oral ----- 40 mg once daily oral x 3 days
- 40 mg daily oral ----- 80 mg once daily oral x 3 days

80 mg daily oral ----- 80mg twice daily oral x 3 days

40 mg twice daily oral----- 80 mg twice daily oral x 3 days

If the total daily dose of 160 mg has no effect on weight the physician will be called to discuss addition of metolazone and to schedule a MD follow-up appointment.

B. Dose Adjustment of loop diuretic (torsemide/Demadex):

#### Regular Dose ----- Adjusted Dose

- 20 mg daily oral ----- 40 mg once daily oral x 3 days
- 20 mg twice daily oral----- 40 mg twice daily oral x 3 days

40 mg twice daily oral----- 60 mg twice daily oral x 3 days & discuss with physician adding metolazone.

C. Dose Adjustment of loop diuretic (bumetanide/Bumex):

#### Regular Dose ----- Adjusted Dose

1 mg daily oral----- 2 mg once daily oral x 3 days

1 mg twice daily oral ----- 2 mg twice daily oral x 3 days

2 mg twice daily oral ------ 3 mg twice daily oral x 3 days & discuss with physician, adding metolazone.

D. Addition of Potassium Chloride

If previous potassium >4.4 mg/dL, or not currently taking potassium supplement, no change in potassium dose may be needed for 3 days of titration. If K <4.4 mg/dL, potassium dose can be increased by 10meq per 20 mg increase in furosemide or torsemide dose, or 1 mg in bumetanide dose. Concurrent use of ACE inhibitor or spironolactone should be taken into account with evaluation of K>4.4, and concurrent digoxin use should be taken into account for K<4.0.

- E. Patient instructions:
  - 1. Go to the lab for blood work (BMP).
  - 2. Weigh self daily and write down the results.
  - Increase diuretic (water pill) as instructed for no more than three days. If instructed to take twice daily, take medication first thing in the morning, and at 12 noon to avoid nighttime urination. (\*\*\* to insert specific instructions)
  - 4. Increase potassium as instructed; take with food. (\*\*\* to insert specific instructions)
  - 5. Return to original diuretic (water pill) dose as soon as your weight returns to baseline. If weight is not back to normal with three days of increased dose, contact your doctor.
  - Go to the lab for repeat blood work (BMP). Related Policies: Related Forms: References: Point of Contact:

### Appendix C

**Heart Failure Checklist** 

Patient Name: MRN: OR Patient Label

Primary cardiologist/attending:					
Discharge date:					
Compliance to medications: No; Yes					
LV function documented in EPIC: No;	Yes				
HF DISCHARGE MEDICATIONS		Yes	No	Comments or, if not prescribed, explanation	Initials
ACE Inhibitor (ACE I)					
ARB (if ACE I intolerant or in addition)					
B – Blocker					
Aldosterone Antagonist					
Digoxin (if Atrial Fibrillation or refractory symptom)					
Lipid-lowering agents					
Hydralazine + Isosorbide dinitrate (combination for Africa	n				
American patients – in addition to ACE I/ARB and Beta Block	ker)				
Nitrates (prn or indefinite, or both)					
Warfarin (if yes, latest INR in comments)					
Oral Direct Thrombin Inhibitor (rivaroxaban or dabigatran)					
Diuretics					
Aspirin					
EDUCATION AND COUNSELING completed?	C	Ordere	ed?	Comments	Initials
Risk modification education, if needed:	Yes	No	N/A		
Tobacco Cessation counseling – Resp Therapy					
ETOH & illicit drug use cessation – Social Work					
Dietician consult					
Weight reduction					
Blood pressure control (low salt diet)					
Dyslipidemia control (low fat diet)					
Diabetes control – Diabetic educator					
Barriers to care assessment (financial, transportation, coping, caregiver support) – Social Work					
IP HF education & discharge instructions (including					
diet & fluid restriction; weight monitoring; recommended					
activity level; discharge medications; what to do, if					
Werferin equipabling _ phormaoist					
Palliative Care discussion by Ord congretive boart foilure					
hospital encounter					
FOLLOW UP appointments & services scheduled?	Yes	No	N/A	Comments	Initials
Cardiologist follow up					
Primary Care follow up (including ECF & home visits)					
Heart Failure Clinic follow up, if indicated					
Cardiac Rehabilitation					
Anticoagulation service follow up, if indicated					
Enrollment in care coordination program (visiting nurse,					
home care, telemonitoring, RCCP, if indicated)	ļ				
Sleep apnea evaluation, if needed					
Supplemental oxygen therapy, if needed					
Other (eg: Electro-Physiology follow up)					

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Time:

## Appendix D

#### Karnofsky Performance Scale

The Karnofsky Performance Scale Index allows patients to be classified as to their functional impairment. This can be used to compare effectiveness of different therapies and to assess the prognosis in individual patients. The lower the Karnofsky score, the worse the survival for most serious illnesses.

#### KARNOFSKY PERFORMANCE STATUS SCALE DEFINITIONS RATING (%) CRITERIA

	100	Normal no complaints; no evidence of disease.		
Able to carry on normal activity and to work; no	90	Able to carry on normal activity; minor signs or symptoms of disease.		
special care needed.	80	Normal activity with effort; some signs or symptoms of disease.		
Unable to work; able to live	70	Cares for self; unable to carry on normal activity or to do active work.		
at home and care for most personal needs; varying	60	Requires occasional assistance, but is able to care for most of his personal needs.		
needed.	50	Requires considerable assistance and frequent medical care.		
	40	Disabled; requires special care and assistance.		
Unable to care for self; requires equivalent of	30	Severely disabled; hospital admission is indicated although death not imminent.		
institutional or hospital care; disease may be	20	Very sick; hospital admission necessary; active supportive treatment necessary.		
progressing rapidly.	10	Moribund; fatal processes progressing rapidly.		
	0	Dead		

References:

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### Appendix E

Palliative Performance Scale							
%	Ambulation	Activity and Evidence of Disease	Self-Care	Intake	Level of Consciousness		
		Normal Activity		Normal	Full		
100	Full	No Evidence of Disease	Full				
		Normal Activity					
90	Full	Some Evidence of Disease	Full	Normal	Full		
00	<b>F</b> II	Normal Activity with Effort	<b>F</b>	Normal or Reduced	Full		
80	Full	Some Evidence of Disease	Full				
70	Reduced	Unable to do Normal Job <b>/</b> Work	E.J.	Normal or Reduced	Full		
70		Some Evidence of Disease	Full				
60	Reduced	Unable to do Hobby <b>/</b> House Work	Occasional Assistance	Normal or Reduced	Full or Confusion		
		Significant Disease	Necessary				
50	Mainly Sit/	Unable to Do Any Work	Considerable Assistance	Normal or Reduced	Full or Confusion		
	LIE	Extensive Disease	Required				
40	Mainly in Bed	As Above	Mainly Assistance	Normal or Reduced	Full or Drowsy or Confusion		
30	Totally Bed Bound	As Above	Total Care	Reduced	Full or Drowsy or Confusion		
20	As Above	As Above	Total Care	Minimal Sips	Full or Drowsy or Confusion		
10	As Above	As Above	Total Care	Mouth Care Only	Drowsy or Coma		
0		Death					

#### Instructions for Use of PPS (see also definition of terms)

- 1. PPS scores are determined by reading horizontally at each level to find a 'best fit' for the patient which is then assigned as the PPS% score.
- 2. Begin at the left column and read downwards until the appropriate ambulation level is reached, then read across to the next column and downwards again until the activity/evidence of disease is located. These steps are repeated until all five columns are covered before assigning the actual PPS for that patient. In this way, 'leftward' columns (columns to the left of any specific column) are 'stronger' determinants and generally take precedence over others.

*Example 1:* A patient who spends the majority of the day sitting or lying down due to fatigue from advanced disease and requires considerable assistance to walk even for short distances but who is otherwise fully conscious level with good intake would be scored at PPS 50%.

*Example 2:* A patient who has become paralyzed and quadriplegic requiring total care would be PPS 30%. Although this patient may be placed in a wheelchair (and perhaps seem initially to be at 50%), the score is 30% because he or she would be otherwise totally bed bound due to the disease or complication if it were not for caregivers providing total care including lift/transfer. The patient may have normal intake and full conscious level.

*Example 3:* However, if the patient in example 2 was paraplegic and bed bound but still able to do some self-care such as feed themselves, then the PPS would be higher at 40 or 50% since he or she is not 'total care.'

- 3. PPS scores are in 10% increments only. Sometimes, there are several columns easily placed at one level but one or two which seem better at a higher or lower level. One then needs to make a 'best fit' decision. Choosing a 'half fit' value of PPS 45%, for example, is not correct. The combination of clinical judgment and 'leftward precedence' is used to determine whether 40% or 50% is the more accurate score for that patient.
- 4. PPS may be used for several purposes. First, it is an excellent communication tool for quickly describing a patient's current functional level. Second, it may have value in criteria for workload assessment or other measurements and comparisons. Finally, it appears to have prognostic value.

#### **Definition of Terms for PPS**

As noted below, some of the terms have similar meanings with the differences being more readily apparent as one reads horizontally across each row to find an overall 'best fit' using all five columns.

#### 1. Ambulation

The items **'mainly sit/lie,' 'mainly in bed,'** and **'totally bed bound'** are clearly similar. The subtle differences are related to items in the self-care column. For example, 'totally bed 'bound' at PPS 30% is due to either profound weakness or paralysis such that the patient not only can't get out of bed but is also unable to do any self-care. The difference between 'sit/lie' and 'bed' is proportionate to the amount of time the patient is able to sit up vs need to lie down.

'Reduced ambulation' is located at the PPS 70% and PPS 60% level. By using the adjacent column, the reduction of ambulation is tied to inability to carry out their normal job, work occupation or some hobbies or housework activities. The person is still able to walk and transfer on their own but at PPS 60% needs occasional assistance.

#### 2. Activity & Extent of disease

**'Some,' 'significant,'** and **'extensive'** disease refer to physical and investigative evidence which shows degrees of progression. For example in breast cancer, a local recurrence would imply 'some' disease, one or two metastases in the lung or bone would imply 'significant' disease, whereas multiple metastases in lung, bone, liver, brain, hypercalcemia or other major complications would be 'extensive' disease. The extent may also refer to progression of disease despite active treatments. Using PPS in AIDS, 'some' may mean the shift from HIV to AIDS, 'significant' implies progression in physical decline, new or difficult symptoms and laboratory findings with low counts. 'Extensive' refers to one or more serious complications with or without continuation of active antiretrovirals, antibiotics, etc.

The above extent of disease is also judged in context with the ability to maintain one's work and hobbies or activities. Decline in activity may mean the person still plays golf but reduces from playing 18 holes to 9 holes, or just a par 3, or to backyard putting. People who enjoy walking will gradually reduce the distance covered, although they may continue trying, sometimes even close to death (eg. trying to walk the halls).

#### 3. Self-Care

**'Occasional assistance'** means that most of the time patients are able to transfer out of bed, walk, wash, toilet and eat by their own means, but that on occasion (perhaps once daily or a few times weekly) they require minor assistance.

**'Considerable assistance'** means that regularly every day the patient needs help, usually by one person, to do some of the activities noted above. For example, the person needs help to get to the bathroom but is then able to brush his or her teeth or wash at least hands and face. Food will often need to be cut into edible sizes but the patient is then able to eat of his or her own accord.

**'Mainly assistance'** is a further extension of 'considerable.' Using the above example, the patient now needs help getting up but also needs assistance washing his face and shaving, but can usually eat with minimal or no help. This may fluctuate according to fatigue during the day.

**'Total care'** means that the patient is completely unable to eat without help, toilet or do any self-care. Depending on the clinical situation, the patient may or may not be able to chew and swallow food once prepared and fed to him or her.

#### 4. Intake

Changes in intake are quite obvious with 'normal intake' referring to the person's usual eating habits while healthy. 'Reduced' means any reduction from that and is highly variable according to the unique individual circumstances. 'Minimal' refers to very small amounts, usually pureed or liquid, which are well below nutritional sustenance.

#### 5. Conscious Level

'**Full consciousness'** implies full alertness and orientation with good cognitive abilities in various domains of thinking, memory, etc. '**Confusion'** is used to denote presence of either delirium or dementia and is a reduced level of consciousness. It may be mild, moderate or severe with multiple possible etiologies. '**Drowsiness'** implies either fatigue, drug side effects, delirium or closeness to death and is sometimes included in the term stupor. '**Coma'** in this context is the absence of response to verbal or physical stimuli; some reflexes may or may not remain. The depth of coma may fluctuate throughout a 24 hour period.

Retrieved from http://www.npcrc.org/usr\_doc/adhoc/functionalstatus/ Palliative%20Performance%20Scale%20(PPSv2).pdf

May 17, 2012

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### **Important Contact Numbers**

- 1. PCP
- 2. Cardiologist
- 3. Heart Failure Clinic: 253.403.4590, fax = 253.403.4591
- 4. Cardiovascular Care Line: 866.382.HEART (this line is directed toward Preventive Cardiology)
- 5. Hospitals: Good Samaritan 253.697.4000, Tacoma General 253.403.1000
- 6. II Information Intelligence: Kristine Lundeen, 253.403.1164
- 7. Care Management: 253.403.4951
- 8. Home Health: 253.301.6400 or 888.516.4504, fax = 253.301.6528
- 9. Palliative Medicine: 253.403.4971, fax = 253.403.1207
- 10. Hospice: 253.301.6400 or 888.516.4504, fax = 253.301.6528
- 11. Covington Heart Center: 253.372.7010 (Holter, TM, PFT)
- 12. Allenmore Heart Center: 253.459.6634 (Holter, TM)
- 13. Preventive Cardiology: 253.403.1059 (Holter, Treadmill)
- 14. Echo Lab, Good Samaritan: 253.697.4500
- 15. Echo Lab, Tacoma General: 253.403.1435
- 16. MultiCare Inpatient Specialists (MIS): 253.403.2368 (Krista Shulman, 253.403.1291 daytime)
- 17. Sound Inpatient Physicians (SIP) at Good Samaritan: 253.697.7655 (Gail Freeman, liaison daytime telephone)
- 18. Tacoma Family Medicine (TFM) Senior Resident at Tacoma General Hospital: 253.254.3800

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Notes:	

49	MultiCare Health System
Notes:	

MultiCare Health System MultiCare Allenmore Hospital ~ MultiCare Auburn Medical Center ~ MultiCare Good Samaritan Hospital MultiCare Mary Bridge Children's Hospital ~ MultiCare Tacoma General Hospital ~ MultiCare Clinics 

