

Summary of Heart Failure Guidelines

1 Diagnostic evaluation of heart failure

History	Symptoms	Examination	Diagnostic tests
<ul style="list-style-type: none"> Family history: <ul style="list-style-type: none"> Cardiomyopathy Cardiovascular disease history Comorbidities Relevant exposures Medications that may cause or exacerbate HF 	<ul style="list-style-type: none"> Dyspnea Orthopnea/PND Bendopnea Edema Fatigue Cognitive dysfunction and depression Chest pain Sleep disorders 	<ul style="list-style-type: none"> Appearance Vital signs, weight Jugular venous distension Pulmonary evaluation: <ul style="list-style-type: none"> Rales Effusion Cardiac evaluation Abdominal evaluation: <ul style="list-style-type: none"> Hepatomegaly Ascites Extremities evaluation Assess risk for adverse outcomes <ul style="list-style-type: none"> Seattle HF Model 	<ul style="list-style-type: none"> CBC, CMP, TSH, Mg, UA Measurement of natriuretic peptide Chest radiograph Electrocardiogram Echocardiogram Consider testing cardiac troponin Other potential tests: <ul style="list-style-type: none"> Noninvasive imaging for myocardial ischemia Cardiac MRI Radionuclide ventriculography Left-heart cath

2 Diagnosis

Type	Ejection fraction
I. HF with reduced EF (HFrEF)	≤ 40%
II. HF with midrange EF (HFmrEF)	> 40 but < 50%
III. HF with preserved EF (HFpEF)	≥ 50%

2a NYHA functional classification

Class	Objective assessment
I	No limitation of physical activity. Ordinary activity does not cause symptoms of HF
II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity causes symptoms of HF
III	Marked limitation of physical activity. Comfortable at rest but less than ordinary physical activity causes symptoms of HF
IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest

3 Common factors that precipitate HF decompensation

<ul style="list-style-type: none"> Medication and/or sodium and/or fluid restriction nonadherence Acute myocardial ischemia Uncontrolled high blood pressure AF and other arrhythmias Initiation of negative inotropic drugs (e.g., verapamil, nifedipine, diltiazem, beta blockers) Initiation of drugs that increase salt retention (e.g., corticosteroids, thiazolidinediones, NSAIDs) 	<ul style="list-style-type: none"> Pulmonary embolus Excessive alcohol use Illicit drug use: amphetamines, cocaine Endocrine abnormalities (e.g., diabetes, hyperthyroidism, hypothyroidism) Concurrent infections (e.g., sepsis, pneumonia, viral illnesses) Additional acute cardiovascular disorders (e.g., valvular disease, endocarditis, myopericarditis, aortic dissection) Deterioration of renal function
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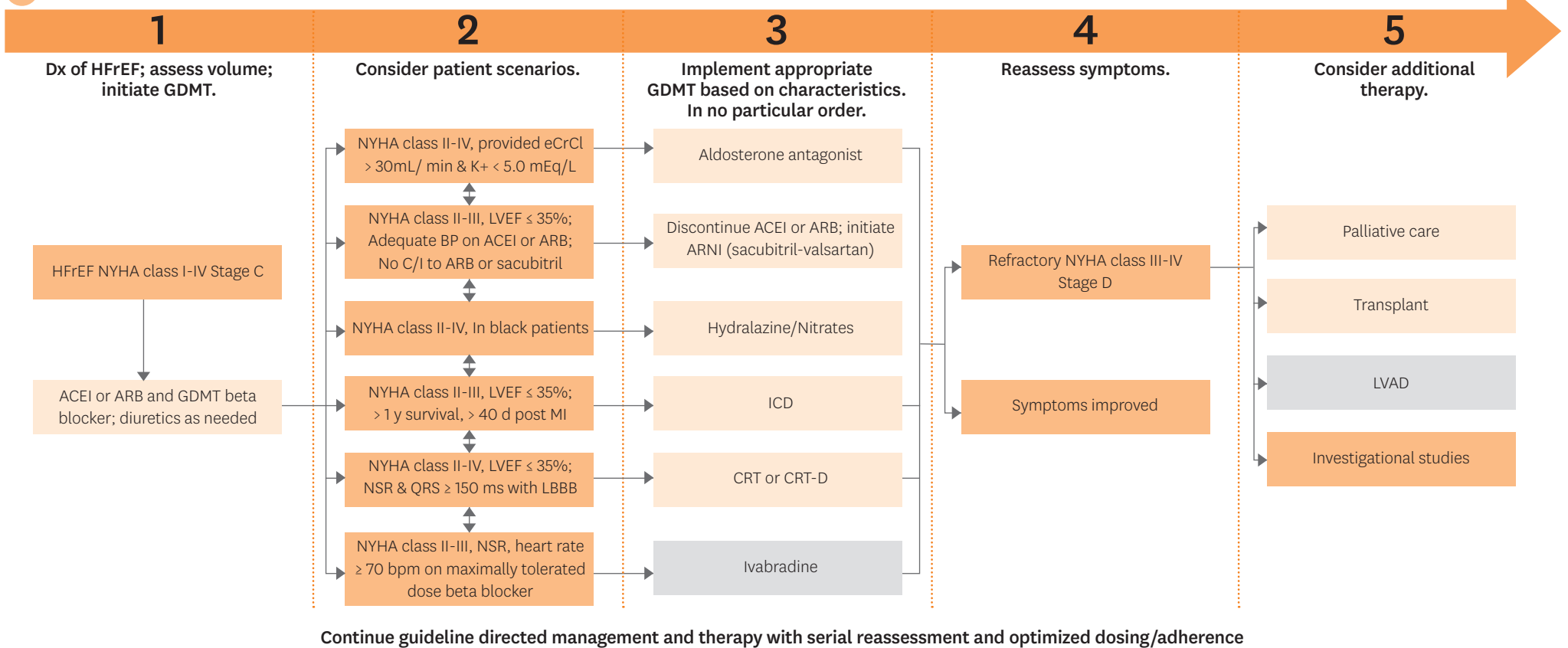
3a Medications that may cause or exacerbate heart failure

<ul style="list-style-type: none"> Calcium channel blockers: verapamil, diltiazem, nifedipine Tricyclic antidepressants Type I antiarrhythmic agents (e.g. flecainide, disopyramide, and quinidine) Corticosteroids Thiazolidinediones (glitazones) Saxagliptin Anthracycline chemotherapeutic agents Tyrosine kinase inhibitors (e.g. sunitinib) 	<ul style="list-style-type: none"> Beta-blockers, if used in unstable or unsuitable patients NSAIDs (nonselective and COX-2 selective) Recreational stimulants: amphetamines, cocaine Drugs that prolong the QT interval TNF-α receptor antagonists Trastuzumab (Herceptin) Minoxidil Clozapine
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	DX	Stage	NYHA	Clinical presentation	Therapy goals and strategies	Treatment recommendations
Progressive stages → Increased morbidity, mortality, and BNP → Progressive treatment	At risk for heart failure	A	N/A	At risk for HF but without structural heart disease or symptoms <ul style="list-style-type: none"> HTN, DM, obesity Metabolic syndrome Atherosclerotic disease 	<ul style="list-style-type: none"> Heart-healthy lifestyle Sodium restriction Prevent vascular, coronary disease Prevent LV structural abnormalities 	<ul style="list-style-type: none"> Treat HTN, optimal BP should be < 130/80 Treat AF, DM, lipid disorders, and atherosclerotic vascular disease; use statins and ACEI or ARB as appropriate Control or avoid obesity, tobacco use, and cardio toxic agents <ul style="list-style-type: none"> Avoid cocaine, methamphetamines, excessive alcohol Monitor patients receiving cardio toxic chemotherapy
		B	I	Structural heart disease but without signs or symptoms of HF <ul style="list-style-type: none"> Previous MI Left ventricle remodeling, including left ventricular hypertrophy (LVH) and low ejection fraction (EF) Asymptomatic valvular disease 	<ul style="list-style-type: none"> Sodium restriction Prevent HF symptoms Prevent further cardiac remodeling 	<ul style="list-style-type: none"> ACEI or ARB, beta blockers, and statins as appropriate if history of MI or ACS ACEI or ARB and beta blockers if rEF even without MI history In selected patients: <ul style="list-style-type: none"> ICD: ischemic cardiomyopathy with LVEFs 30% Revascularization or valvular surgery Avoid nondihydropyridine calcium channel blockers
		C	I-IV	Structural heart disease with prior or current symptoms <ul style="list-style-type: none"> Known structural heart disease, and HF signs and symptoms: <ul style="list-style-type: none"> Shortness of breath and fatigue Reduced exercise tolerance 	<ul style="list-style-type: none"> Patient education on self-care Sodium restriction Identify comorbidities Screen for and treat sleep disorders Control symptoms, prevent hospitalizations and mortality Improve health-related quality of life (HRQOL) 	HFpEF <ul style="list-style-type: none"> Follow guideline driven indications for comorbidities: <ul style="list-style-type: none"> HTN: goal SBP < 130, use ACEI/ARB/beta blockers AF, CAD, DM Consider ARBs HFrEF Step 1: <ul style="list-style-type: none"> ACEI or ARB and beta blockers Diuretics as needed for fluid overload
Heart failure	D	IV	Refractory HF requiring specialized interventions <ul style="list-style-type: none"> Marked HF symptoms at rest despite maximal medical therapy Recurrent hospitalizations or cannot be discharged without specialized interventions 	<ul style="list-style-type: none"> Control symptoms Improve HRQOL Prevent hospital readmissions Establish patient's end-of-life goals 	<ul style="list-style-type: none"> Palliative care Transplant Left Ventricular Assist Device (LVAD) Investigational studies 	

4a Treatment of HFrEF Stage C and D



5 Drugs commonly used for HFrEF (Stage C HF)

 Drug	 Initial daily dose	 Maximum daily dose
ACEIs: Angiotensin converting enzyme inhibitors		
Captopril	6.25 mg TID	50 mg TID
Enalapril	2.5 mg BID	10-20 mg BID
Fosinopril	5-10 mg QD	40 mg QD
Lisinopril	2.5-5 mg QD	20-40 mg QD
Perindopril	2 mg QD	8-16 mg QD
Quinapril	5 mg BID	20 mg BID
Ramipril	1.25-2.5 mg QD	10 mg QD
Trandolapril	1 mg QD	4 mg QD
ARBs: Angiotensin receptor blockers		
Candesartan	4-8 mg QD	32 mg QD
Losartan	25-50 mg QD	50-150 mg QD
Valsartan	20-40 mg BID	160 mg BID
ARNIs: Angiotensin receptor-neprilysin inhibitors		
Sacubitril/valsartan	49/51 mg BID may start at 24/26 mg BID	97/103 mg BID
I_f channel inhibitor		
Ivabradine	5 mg BID	7.5 mg BID
Aldosterone antagonists		
Spirolactone	12.5-25 mg QD	25 mg QD or BID
Eplerenone	25 mg QD	50 mg QD
Beta blockers		
Bisoprolol	1.25 mg QD	10 mg QD
Carvedilol	3.125 mg BID	50 mg BID
Carvedilol CR	10 mg QD	80 mg QD
Metoprolol Succinate ER (metoprolol CR/XL)	12.5-25 mg QD	200 mg QD
Isosorbide dinitrate (ISDN) and Hydralazine (HYD)		
Fixed-dose combination	20 mg ISDN/37.5 mg HYD TID	40 mg ISDN/75 mg HYD TID
Isosorbide dinitrate and hydralazine	20-30 mg ISDN/25-50 mg HYD TID or QID	40 mg ISDN/100 mg HYD TID
Sodium-glucose cotransporter 2 inhibitors (SGLT2i)		
Dapagliflozin	10 mg once	10 mg once

6 Recommendations for hospital discharge after decompensated HF



Schedule follow-up visit within 7 to 14 days and telephone follow-up within 3 days



Address while inpatient, at discharge, and in follow-up visits:

- Initiation of GDMT if not done or contraindicated
- Causes of HF, barriers to care, and limitations in support
- Assessment of volume status and blood pressure with adjustment of HF therapy
- Optimization of chronic oral HF therapy
- Renal function and electrolytes
- Management of comorbid conditions
- HF education, self-care, emergency plans, and adherence
- Palliative or hospice care



Refer high-risk patients to multidisciplinary HF disease management programs

7 Recommendations for HF patient education and self-management



Heart failure disease education:

- Causes
- Definition, what is heart failure
- Diagnosis
- HF symptoms and signs of decompensation: fatigue/tiredness, weakness, weight gain, edema, SOB

Heart-healthy lifestyle:

- Diet: low sodium, limit fats and cholesterol, limit alcohol
- Regular physical activity for patients able to participate
- Stress reduction, adequate rest, and social support
- Monitor and control of high blood pressure
- Smoking cessation
- Weight loss if obese and maintenance of healthy weight if underweight
- Monitor intake and restrict fluids in advanced or decompensated HF



Take medications as prescribed



Identify and avoid decompensation triggers (e.g. excessive salt intake, missing medication doses, or exercising too hard)



Treatment:

- Cardiac rehabilitation to improve function: exercise, heart-healthy diet, and stress reduction
- Medications
- Devices
- Procedures and surgery

References and Resources

- Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on practice guidelines. *Circulation*. 2013;128(16):e240-e327
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- Korabathina R, Fountain LB, Eckstein D, Wojnowich K. Heart Failure Update. *FP Essent*. 216;442:1-48.
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