

Heart Failure (HF)

These Clinical Practice Guidelines are guidelines only. In no way should these be used as a substitute for clinical or medical judgment. For specialty patient populations such as elderly or post-partum patients, refer to evidenced based practice guidelines to best serve these populations' unique needs.

Contributing Factors

- Ischemic heart disease and myocardial infarction
- Hypertension
- Valve and myocardial structural defects
- Arrhythmias
- Metabolic derangement
- Toxic damage
- Infiltrative diseases
- Diabetes

Complications

- Memory loss
- Confusion
- Cachexia
- Pleural effusions
- Hepatic congestion
- Renal failure
- Poor quality of life
- Sudden cardiac death
- Death


Symptoms of Heart Failure

- Shortness of breath, orthopnea, or bendopnea (shortness of breath when bending at the waist)
- Reduced exercise tolerance
- Fatigue, tiredness, increased time to recover after exercise
- Ankle swelling



Stages of Heart Failure

Stage A

At risk for heart failure 

Stage B

Structural heart disease and/or evidence of increased filling pressures without symptoms of heart failure

Stage C

Current or previous symptoms/signs of heart failure

Stage D

Refractory symptoms despite optimal medical therapy



Treatment and Management

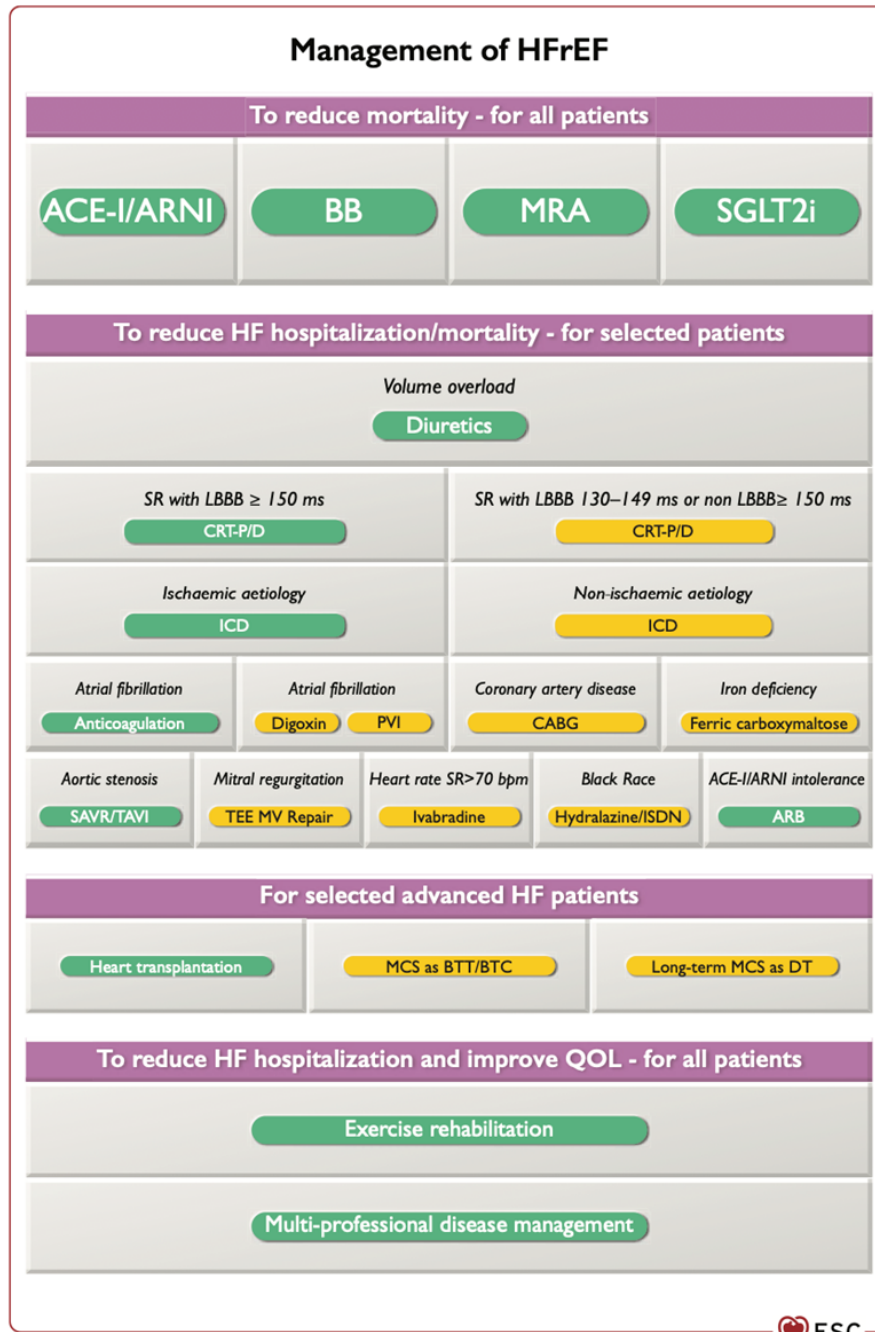


Figure Central illustration. Strategic phenotypic overview of the management of heart failure with reduced ejection fraction. ACE-I = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; ARNI = angiotensin receptor-neprilysin inhibitor; BB = beta-blocker; b.p.m. = beats per minute; BTC = bridge to candidacy; BTT = bridge to transplantation; CABG = coronary artery bypass graft; CRT-D = cardiac resynchronization therapy with defibrillator; CRT-P = cardiac resynchronization therapy pacemaker; DT = destination therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; ICD = implantable cardioverter-defibrillator; ISDN = isosorbide dinitrate; LBBB = left bundle branch block; MCS = mechanical circulatory support; MRA = mineralocorticoid receptor antagonist; MV = mitral valve; PVI = pulmonary vein isolation; QOL = quality of life; SAVR = surgical aortic valve replacement; SGLT2i = sodium-glucose co-transporter 2 inhibitor; SR = sinus rhythm; TAVI = transcatheter aortic valve replacement; TEE = transcatheter edge to edge. Colour code for classes of recommendation: Green for Class of recommendation I; Yellow for Class of recommendation IIa (see Table 1 for further details on classes of recommendation). The Figure shows management options with Class I and IIa recommendations. See the specific Tables for those with Class IIb recommendations.

Figure is from the ESC, European Heart Journal Volue 42, Issue 36, Sept.21, 2021 in Section 5.2.1, Figure 2

Lifestyle Role as a Risk Factor to Heart Failure and Symptom Management

- Self-care and symptom monitoring—monitor and recognize changes in signs and symptoms; know when and how to contact a healthcare professional
- Diet and alcohol — avoid excessive fluid intake; monitor body weight and prevent malnutrition; avoid excessive salt intake; maintain healthy body weight; abstain or avoid excessive alcohol intake
- Smoking and recreational substance use — stop smoking and taking recreational substances
- Exercise — undertake regular exercise to provoke mild or moderate breathlessness

Tests

Test	Mode	Test Description
BNP (B-type Natriuretic Peptide)	Lab draw	Blood test measuring the amount of BNP hormone in your blood. In heart failure, BNP release is increased as your heart has to work harder.
Echocardiography	Non-invasive ultrasound	TTE—transthoracic echo for assessment of myocardial systolic and diastolic function of both left and right ventricles.
12-Lead ECG (Electrocardiogram)	Non-invasive	Determines electrical activity of heart including heart rhythm, heart rate, QRS morphology, QRS duration, and any relevant abnormalities.

Why is this work-up necessary?

These tests can aid in diagnosing heart failure versus other diseases causing symptoms. Test results may require additional work-up and/or indicate that treatment is necessary with heart failure medications.



When to Refer to Advanced Heart Failure

The SHARK Acronym

- S**odium (hyponatremia NA <136)
- H**ospitalizations: readmit in 30 days or ≥2 hospital stays in 6 months
- A**rrhythmias (atrial/ventricular)
- R**efractory to meds (ACE/ARB/BB)
- K**idney failure (Cr ≥ 1.2, or > 0.3 increase from baseline)

Scheduling

The full range of cardiac testing is available at Cleveland Medical Center. Many tests are also available at other UH Medical Centers. For assistance in scheduling, contact:

- Harrington Heart & Vascular Scheduling 216-844-3800
- UH Physician Referrals 800-552-8338 / 216-844-7553
- If connected to the UH Intranet, please click the blue hyperlink for the: [online referral form](#)



ICD10 Codes for Heart Failure

Diagnosis	ICD10 Code
Left ventricular failure, unspecified	150.1
Unspecified systolic (congestive) heart failure	150.20
Unspecified diastolic (congestive) heart failure	150.30
Chronic combined systolic (congestive) and diastolic (congestive) heart failure	150.42
Right ventricular failure, unspecified	150.810
Heart failure, unspecified	150.9

Accuracy Matters

- Timely and appropriate documentation has long term implications that affect the overall cost and quality of patient care.
- It is essential that the most appropriate and specific diagnosis codes are entered at each and every patient encounter.

Medications

- ACE-I / ARB / ARNi are recommended for HFrEF patients to reduce the risk of hospitalization or death and are considered to be first line therapies. ARNi has shown to be superior to ACE-I and ARB, but has low economic value
- Beta-blockers are recommended for all patients with HFrEF to reduce the risk of death and the combined risk of death or hospitalization in patients with HFrEF. Even if EF improves over 40%, beta-blockers should not be discontinued
- Mineralocorticoids receptor antagonists (MRAs) are recommended for patients with HFrEF to reduce the risk of HF hospitalization and death.
- Sodium-glucose co-transporter 2 inhibitors (SGLT2i) are now recommended to reduce hospitalization for HF and cardiovascular mortality, irrespective of the presence of Type 2 Diabetes
- Diuretics are recommended in order to relieve congestions, improve symptoms, exercise capacity, and preventing HF worsening. Diuretics improve symptoms but have no mortality benefit. Loop diuretics are the preferred diuretic agents.
- Hydralazine and Isosorbide Dinitrate combination with optimal medical therapy have shown to improve symptoms and decrease the risk of hospitalization and death in self-identified African American patients.

Common Initial Oral Dosages for Adults

Drug	Cost	Initial Daily Dose	Target Doses
ACEi			
Lisinopril	\$	2.5-5 mg once daily	20-40 mg once daily
ARB			
Candesartan	\$	4-8 mg once daily	32 mg once daily
Losartan	\$	25-50 mg once daily	50-150 mg once daily
Valsartan	\$	20-40 mg once daily	160 mg twice daily
ARNi			
Sacubitril-valsartan	\$\$\$\$	49 mg sacubitril and 51 mg valsartan twice daily (therapy may be initiated at 24 mg sacubitril and 26 mg valsartan twice daily)	97 mg sacubitril and 103 mg valsartan total twice daily
Beta blockers			
Bisoprolol	\$	1.25 mg once daily	10 mg once daily
Carvedilol	\$	3.125 mg twice daily	25-50 mg twice daily
Metoprolol succinate extended release (metoprolol CR/XL)	\$	12.5-25 mg once daily	200 mg once daily
Mineralocorticoid reception antagonists			
Spirololactone	\$	12.5-25 mg once daily	25-50 mg once daily
Eplerenone	\$\$	25 mg once daily	50 mg once daily
SGLT2i			
Dapagliflozin	\$\$\$\$	10 mg once daily	10 mg once daily
Empagliflozin	\$\$\$\$	10 mg once daily	10 mg once daily
Isosorbide dinitrate and hydralazine			
Isosorbide dinitrate and hydralazine	\$	20-30 mg isosorbide dinitrate and 25-50 mg hydralazine 3-4 times daily	120 mg isosorbide dinitrate total daily in divided doses and 300 mg hydralazine total daily in divided doses
I_f Channel inhibitor			
Ivabradine	\$\$\$\$	5 mg twice daily	7.5 mg twice daily
Digoxin	\$	0.125 mg daily (modified according to nomogram)	Individualized variable dose to achieve serum digoxin concentration 0.5-<0.9 ng/mL

ACE indicates angiotensin-converting enzyme; ARB, angiotensin receptor blocker; CR, controlled release; CR/XL, controlled release, extended release; HF, heart failure; NA, not applicable; NR, not reported; and SGLT2i, sodium glucose cotransporter 2 inhibitor.

Common Initial Oral Dose Cost Estimates

**Please note that these are estimates without prescription coverage. When determining costs, please keep in mind if the patient has insurance and the patient's insurance.*

\$ = least expensive under \$30/30 day supply
 \$ = under \$100/30 day supply
 \$\$ = under \$150/30 day supply
 \$\$\$ = under \$250/30 day supply
 \$\$\$\$ = \$300 and above 30/ day supply

Depression and Heart Failure

- Depression is common and is associated with worse clinical status and a poor prognosis, also possibly contributing to poor adherence and social isolation.
- Routine screening using a validated questionnaire is good practice (Beck Depression Inventory (BDI) and Cardiac Depression Scale have been formally validated as reliable tools for the assessment of depressive mood in patients with HF)
- Psychosocial intervention and pharmacological treatment are helpful, as well as exercise training, in patients with HF and depression.
- Cognitive behavioral therapy delivered in patients with HF and major depression, beyond standard care and a structured education program, were able to reduce depression severity, anxiety and fatigue symptoms, as well as improve social functioning and mental and HF-related quality of life.
- Tricyclic antidepressants should be avoided, because they may cause hypotension, worsening HF and arrhythmias.

Diet Considerations

Nutrition

Adults with heart failure can be educated on different elements of self-care to help manage their condition and improve quality of life. For many patients, a discussion with a dietitian can help increase engagement to develop an eating plan, educate on energy needs, sodium and fluid needs, physical activity, and self-monitoring weight and symptoms.

Sodium Restriction

Avoiding excessive sodium intake is imperative to maintaining health and fluid balance in patients with heart failure. Sodium intake is usually limited to 2000 - 3000 mg per day. It is also recommended to follow the DASH pattern of eating as well.

Skills that increase adherence to a low sodium diet include:

- Ability to read a nutrition label
- Ability to calculate total daily sodium intake
- Recognition of foods that are 'hidden' sources of salt
- Understanding the relationship between sodium intake and edema
- Understand how to flavor food without using salt

Nutrition education should focus on educating the patient to be able to:

- Choose low-sodium foods and avoid high-sodium foods in the grocery store and while dining out
- Reduce sodium intake and added salt at home
- Rinse canned goods before eating
- Avoid salty snacks, processed and instant foods
- Read and understand nutrition labels
- Learn ways to flavor foods using spices and salt-free seasonings

Fluid Restriction

Fluid restriction as determined by the physician. Nutrition Education should focus on:

- Tracking fluid intake
- Identifying sources of fluid (ie. jello, soup, ice cream, popsicles, etc)

Weight Assessment

Underweight (BMI <18.5)

- There are subgroups of heart failure patients who have resting hypermetabolism and increased protein breakdown. Increasing calorie and protein intake is warranted.

Overweight or Obese (BMI >25)

- Weight loss may be warranted to help manage heart failure. Purposeful weight loss through nutrition education, dietitian support, and physical activity may improve health-related quality of life and other comorbidities as well.



Social Determinants of Health Assessment

In order to engage and empower patients to be active in their care, it is also necessary to assess Social Determinants of Health (SDOH). Patients can be unwillingly impacted by SDOH, which will affect a patient's capacity to adhere to his/her treatment plan. Keep this in mind and assess accordingly, to provide proper referrals to encircle the patient with support to achieve his/her optimal health.

Consider the following:

- Financial restrictions can impact a family's ability to afford nutritious foods and medications.
- Geography can impact accessibility of healthy and affordable food.
- The patient's own understanding and perceptions.
- Capacity to exercise as well as physical and behavioral limitations that may require referrals to physical therapy or exercise support.
- Patient may have behavioral and/or psychological barriers that may be influencing and perpetuating lifestyle habits.
- Health literacy and comprehension

Anticipatory Guidance / Self-Management

Self-care and symptom monitoring—monitor and recognize changes in signs and symptoms; know when and how to contact a healthcare professional.



Self-Check Plan

for HF Management



Excellent – Keep Up the Good Work!



No new or worsening shortness of breath



Physical activity level is normal for you



No new swelling, feet, ankles and legs look normal for you



Weight check stable
Weight: _____



No chest pain

GREAT!
CONTINUE:

 Daily Weight Check

 Meds as Directed

 Low-Sodium Eating

 Follow-up Visits

 **Pay Attention – Use Caution!**



Dry, hacking cough



Worsening shortness of breath with activity



Increased swelling of legs, ankles and feet



Sudden weight gain of more than 2-3 lbs in a 24-hour period (or 5 lbs in a week)



Discomfort or swelling in the abdomen



Trouble sleeping

CHECK IN!

Your symptoms may indicate:

 A need to contact your doctor or health care team

 A need for a change in medications

 **Medical Alert - Warning!**



Frequent dry, hacking cough



Shortness of breath at rest



Increased discomfort or swelling in the lower body



Sudden weight gain of more than 2-3 lbs in a 24-hour period (or 5 lbs in a week)



New or worsening dizziness, confusion, sadness or depression



Loss of appetite



Increased trouble sleeping; cannot lie flat

WARNING!

You need to be evaluated right away.



Call your physician or call **911**

<https://www.heart.org/-/media/files/health-topics/heart-failure/hf-symptom-tracker.pdf>

References

Academy of Nutrition and Dietetics. (2018). Academy of Nutrition and Dietetics Evidence-Based Practice Guideline for the Management of Heart Failure in Adults. *Journal of the Academy of Nutrition and Dietetics*. DOI: 10.1016/j.jand.2018.03.004

UptoDate. (2019). Heart Failure Self-Management. Retrieved from: <https://www.uptodate.com/contents/heart-failure-self-management>

Nutrition Care Manual: Heart Failure, https://www.nutritioncaremanual.org/topic.cfm?ncm_category_id=1&lv1=272984&lv2=8585&ncm_toc_id=8585&ncm_heading=Nutrition%20Care

2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *European Journal of Heart Failure*. 2016. 18:891- 975. DOI:10.1002/ejhf592.

2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *European heart journal*, 42(36), 3599–3726. <https://doi.org/10.1093/eurheartj/ehab368>

2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. *American Heart Association Journal*, 145(18), 895-1032. DOI: 10.1161/CIR.0000000000001063

2022 ACC Guidelines for Sodium. Retrieved from: https://www.jacc.org/doi/pdf/10.1016/j.jacc.2021.12.012?_ga=2.101766466.2117219661.1679579671-926743091.1679579671&

Nutrition Education & Recipes: <https://www.heart.org/en/healthy-living/healthy-eating/eat-smart>

Grocery Store Guidance – look for the heart check: <https://www.heart.org/en/healthy-living/healthy-eating/heart-check-foods>

Nutrition Care Manual by the Academy of Nutrition and Dietetics handouts (any UH provider can log in through the DWP and see them).

Special thanks to the CPG Development Team: Molly Loy, RN, Zafer Sattouf, MD, Carol Bahner, BSN, RN, CCM, Terry Widenhofer, BSN, RN, CCM, and Taylor Dews, MA . The UH Quality Care Network (UHQCN) and the physician led board of directors developed and reviewed this Clinical Practice Guideline (CPG).

© 2023 University Hospitals Health System, Inc.

Disclaimer: The contents of University Hospitals Quality Care Network (“QCN”) clinical practice guidelines (“CPGs”) are to be used as practical and deliberately brief guides for licensed QCN provider participants. CPGs are not strict protocols and do not replace a licensed QCN provider participant’s clinical judgment nor are they meant to be a replacement for licensed QCN provider participant’s training, experience, continuing medical education and self-study on the latest literature and drug information. QCN has made every effort to ensure that the information provided in CPGs are based upon best available scientific evidence at the time of publication. Nonetheless, the CPGs should never be relied on as a substitute for proper assessment with respect to the particular circumstances of each case and the needs of each patient. QCN accepts no responsibility for any inaccuracies in a CPG, evidence based changes to best practices after publication of a CPG, or outcomes of any treatment regime recommended within a CPG. Send feedback to: Patrick Runnels, MD, MBA, Population Health Chief Medical Officer (Patrick.Runnels1@UHhospitals.org).