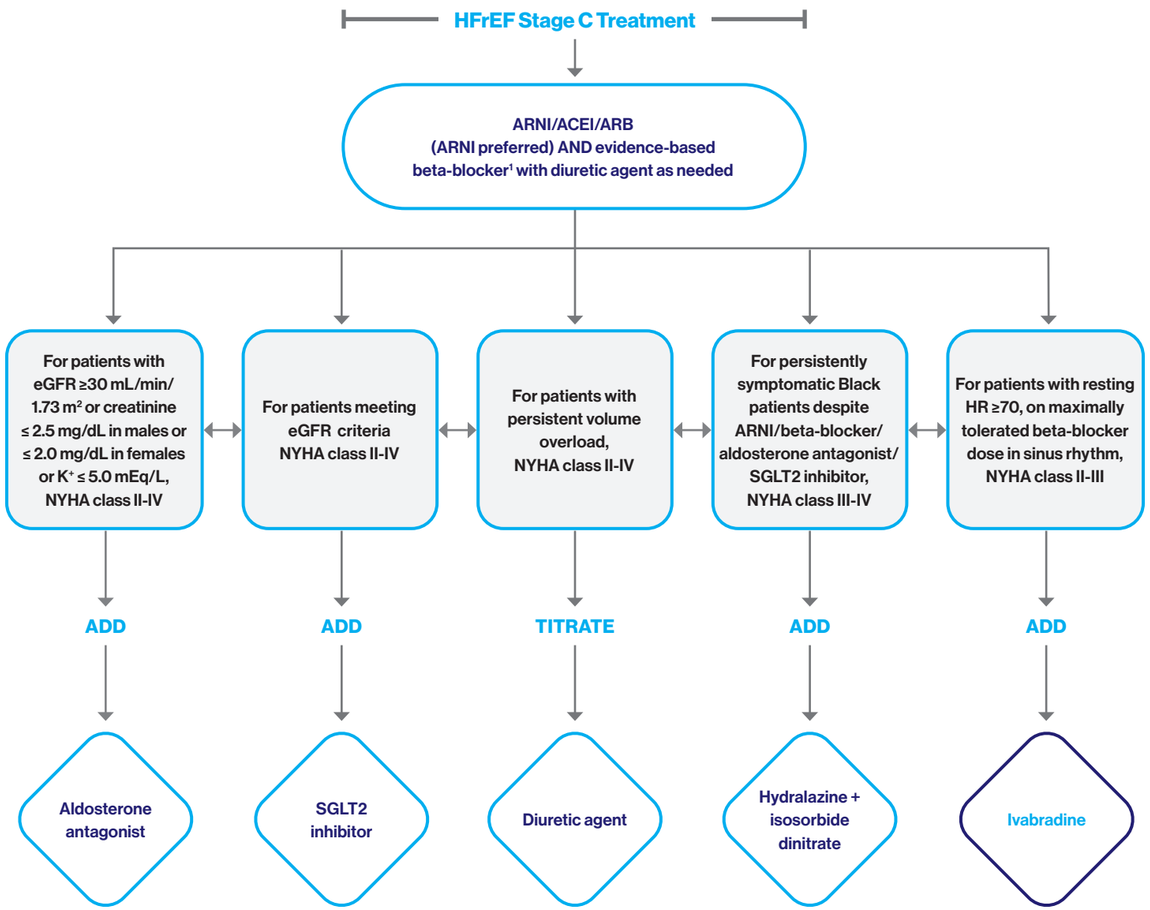
Heart Failure (HF)
Quick Reference Guide

Mount Sinai Health Partners

Treatment Algorithm for Guideline Directed Medical Therapy Including Novel Therapies



It is recommended that only one of the following Beta-blocker, ACE, ARB, ARNI, Aldosterone antagonist be increased at each visit. If the patient is hemodynamically stable, it is generally acceptable to double the dose of these agents when escalating the dose.

Charts and figures reprinted with permission from Elsevier. Yancy CW, Januzzi JL Jr, Allen L A et al. 2017 ACC expert consensus decision pathway for optimization of heart failure treatment: answers to 10 pivotal issues about heart failure with reduced ejection fraction: a report of the American College of Cardiology Task Force on Clinical Expert Consensus Decision Pathways. *J Am Coll Cardiol.* 2018;71:201-30.

Starting and Target Doses of Select Guideline-Directed Medical Therapy (GDMT) for HF

	STARTING DOSE	TARGET DOSE
ARNI		
Sacubitril/valsartan	24/26 mg-49/51 mg 2x daily	97/103 mg 2x daily
ACEI		
Captopril	6.25 mg 3x daily	50 mg 3x daily
Enalapril	2.5 mg 2x daily	10-20 mg 2x daily
Lisinopril	2.5-5 mg daily	20-40 mg daily
Ramipril	1.25 mg daily	10 mg daily
ARB		
Candesartan	4-8 mg daily	32 mg daily
Losartan	25-50 mg daily	150 mg daily
Valsartan	40 mg 2x daily	160 mg 2x daily
BETA BLOCKERS		
Bisoprolol	1.25 mg daily	10 mg daily
Carvedilol	3.125 mg 2x daily	25 mg 2X daily for weight <85 kg, 50 mg 2X daily for weight ≥ 85 kg
Metoprolol succinate*	12.5-25 mg daily	200 mg daily
ALDOSTERONE ANTAGONISTS		
Eplerenone	25 mg daily	50 mg daily
Spironolactone	12.5-25 mg daily	25-50 mg daily
VASODILATORS		
Hydralazine	25 mg 3x daily	75 mg 3x daily
Isosorbide dinitrate	20 mg 3x daily	40 mg 3x daily
Fixed-dose combination isosorbide dinitrate/hydralazine	20 mg/37.5 mg (one tab) 3 x daily	2 tabs 3x daily
IVABRADINE		
Ivabradine	2.5-5 mg 2x daily	Titrate to HR 50-60 bpm. Max dose 7.5 mg 2x daily
DIURETICS-LOOP		
Bumetanide	0.5-1 mg 1x or 2x daily	10 mg daily
Furosemide	20-40 mg 1x or 2x daily	400 mg daily
Torsemide	10-20 mg daily	200 mg daily
DIGOXIN		
Digoxin	0.125 mg daily	0.25 mg daily
SGLT2 INHIBITORS		
Dapagliflozin	10 mg daily	10 mg daily
Empagliflozin	10 mg daily	10 mg daily

***** Unlike immediate-release metoprolol and atenolol, metoprolol ER is proven to improve symptoms of heart failure, lower the risk of death from heart failure, and lower the risk of hospitalization due to heart problems. While atenolol is technically another hypertension drug, it doesn't have these additional benefits.

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Ischemic Evaluation

Noninvasive cardiac imaging is indicated to detect myocardial ischemia and viability in HFrEF and HFpEF patients with known or suspected CAD. Cardiac catheterization should be considered for patients with significant CAD who would be candidates for revascularization (PCI or CABG)..

Heart Failure with Reduced Ejection Fraction (HFrEF)

HFrEF is an EF less than or equal to 40%. There is a mortality benefit proven with Carvedilol, long acting metoprolol (succinate), and bisoprolol, ACE inhibitors/ARBs or Spironolactone.

Heart Failure with Preserved Ejection Fraction (HFpEF)

A clinical syndrome in which patients have symptoms and signs of HF, a normal or near normal left ventricular ejection fraction (LVEF ≥50 percent), and evidence of cardiac dysfunction as a cause of symptoms (i.e. abnormal left ventricular filling and elevated filling pressures).

- ~50% of patients with HF have an EF>50%, a proportion that is increasing over time and is the dominant form of HF in the elderly
- No therapies have a proven mortality benefit, unlike HFreF

HFpEF primary treatment focuses on maintaining euvolemia and effectively managing associated comorbidities.

- Major disease focus areas: Atrial fibrillation, Coronary Artery Disease, Diabetes, Pulmonary Hypertension, Obesity, Cardiac Valvular Disease, Chronic Anemia and Rheumatologic Disease.

Medications to Avoid in HF

- NSAIDs in **all types** of HF
- Second generation calcium channel blockers such as amlodopine may be used for blood pressure control in **HFrEF**. Other calcium channel blockers such as verapamil, diltiazem, and nifedipine should be avoided in patients with **HFrEF**.
- Nitrates in **HFpEF**

New Therapies for HFrEF: SGLT-2i (Sodium Glucose Cotransporter-2 Inhibitors)

SGLT-2i: Canagliflozin (trade: Invokana), Dapagliflozin (trade: Farxiga), and Empagliflozin (trade: Jardiance)

- **When to consider and how to prescribe:** In patients with and without diabetes, with HFrEF or worsening CKD, (Step 4 if still symptomatic on ARNI, B-Blocker, Mineralocorticoid Receptor Antagonist) consider adding a SGLT2 Inhibitor if GFR >30.
- **HFpEF BNP considerations:** Absolute values are lower than in HFpEF, with up to 30% of HFpEF patients having normal levels.[1]

Triggers for Patient Referral to a Heart Failure Specialist/Program

- **New-onset HF (regardless of EF):** Refer for evaluation of etiology, guideline-directed evaluation and management of recommended therapies, and assistance in disease management, including consideration of advanced imaging, endomyocardial biopsy, or genetic testing for primary evaluation of new-onset HF
- **Chronic HF with high-risk features**, such as development of 1 or more of the following risk factors:
  - Need for chronic IV inotropes
  - Persistent NYHA functional class III-IV symptoms
  - Systolic blood pressure ≤90 mm Hg or symptomatic hypotension
  - Creatinine ≥1.8 mg/dl or BUN ≥43 mg/dl
  - Onset of atrial fibrillation, ventricular arrhythmias, or repetitive ICD shocks
  - Two or more ED visits or hospitalizations for worsening HF in prior 12 months
  - Inability to tolerate Guideline Directed Medical Therapy (GDMT)
  - Clinical worsening
- To assist with management of GDMT, including replacement of ACEI or ARB therapy with ARNI for eligible patients or to address comorbid conditions
- Annual review for patients with established advanced HF
- Persistent reduced LVEF ≤35% despite GDMT for ≥3 months for consideration of device therapy in those patients without prior placement of ICD or CRT, unless decide therapy contraindicated

Vaccinations

Influenza vaccine	Recommended for all patients with HF
Pneumococcal vaccination	The PPSV23 is recommended for all adult patients with heart failure. Administration of PCV13 should also be considered for patients ≥65 years old.

When to Refer for Device Therapy

Consider EP referral for primary ICD or CRT in patients with EF ≤ 35% for at least 90 days (or 40 days post MI) on chronic GDMT

When to Refer to Cardiac Rehab[2]

People of all ages with heart conditions, including HF, can benefit from a cardiac rehab program.

Medicare and most other insurers provide reimbursement for cardiac rehab for HFrEF.

Locations

Mount Sinai Doctors - East 85th Street
Address: 234 E 85th Street, Lower Level, New York, NY 10028
Phone: 212-241-8597

Mount Sinai South Nassau
Address: 440 Merrick Road, Oceanside, NY 11572
Phone: 516-255-8280

Mount Sinai Care Coordination

How to refer:

- Email **mshpcmreferral@mountsinai.org**
- Call **212-241-7228**
- MSHP Care Management Referral in Epic (order #391414)

Providers who refer patients can expect:

- Prompt and efficient processing of your referral
- Communication about referral processing and assignment through the Epic Inbasket
- Follow up from clinical staff within one week of assignment

Pharmacists

- Key members of the care team who can prescribe/adjust medications in collaboration with the PCP and specialist
- Can assist with chronic disease management, including heart failure, hypertension, diabetes, and COPD, as well as medication reconciliation and adherence, and polypharmacy

Behavioral Health

Patients should be screened for depression using the PHQ-2/PHQ-9 and referred to psychiatric services through their current care pathway depending on their clinic.

Palliative Care

Palliative care is beneficial at any stage of a serious illness[3]

- Palliative care, and the medical sub-specialty of palliative medicine, is specialized medical care for people living with serious illness
- It focuses on providing relief from the symptoms and stress of a serious illness
- The goal is to improve quality of life for both the patient and their family

Referral Criteria:
Consider a specialty-level palliative care referral for patients who meet any of these criteria:

- **NYHA class III/IV symptoms with frequent heart failure readmissions;**
- **Anxiety or depression** adversely affecting patient's quality of life or their ability to manage their illness; AND
- Assistance with decision making regarding advanced therapies (LVAD, transplant, home inotropic therapy).

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Palliative Care within Mount Sinai Health System
Patients with CHF may be referred to either practice. The services provided at each location are identical; please choose the location most convenient for your patient.

Martha Stewart Center for Living
1440 Madison Avenue
New York, NY 10029
212-241-1446

Martha Stewart Center for Living Downtown
10 Union Square East
New York, NY 10003
212-844-1712

1 Henning RJ. Diagnosis and treatment of heart failure with preserved left ventricular ejection fraction World J Cardiol 2020 January 26; 12(1): 7-25

2 American Heart Association: Am I Eligible for Cardiac Rehab: https://www.heart.org/en/health-topics/cardiac-rehab/am-i-eligible-for-cardiac-rehab

3 Center to Advance Palliative Care; Serious Illness Quality Alignment HUB: State Palliative Care Definitions and Standards. Available at: https://www.capc.org/documents/133/

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