# Halting the Spiral of Worsening Heart Failure With Reduced Ejection Fraction (HFrEF): A POCKET GUIDE

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## HFrEF = signs and symptoms of heart failure + LVEF ≤40%

### Markers of Worsening Heart Failure

**Clinical**
- Worsening signs/symptoms
- Severity of congestion
- Decreased exercise capacity

**Sub-Clinical**
- Biomarkers
- Imaging
- Devices (PAP monitoring)

**Events**
- Hospitalization
- ED visits
- Outpatient (IV therapy/oral therapy escalation)

**Outcomes**
- Increased risk of subsequent mortality & rehospitalizations
- Poor health status and QoL
- Need for transplant or VAD

## GDMT = 1) RAS inhibitors, 2) evidence-based beta-blockers, 3) MRAs, and 4) SGLT2 inhibitors
## Most beneficial when medications from the 4 drug classes are used in conjunction, +/- diuretics

### Recommended Therapies for HFrEF Stages C and D

**STEP 1** Established diagnosis of HFrEF; address congestion; initiate GDMT

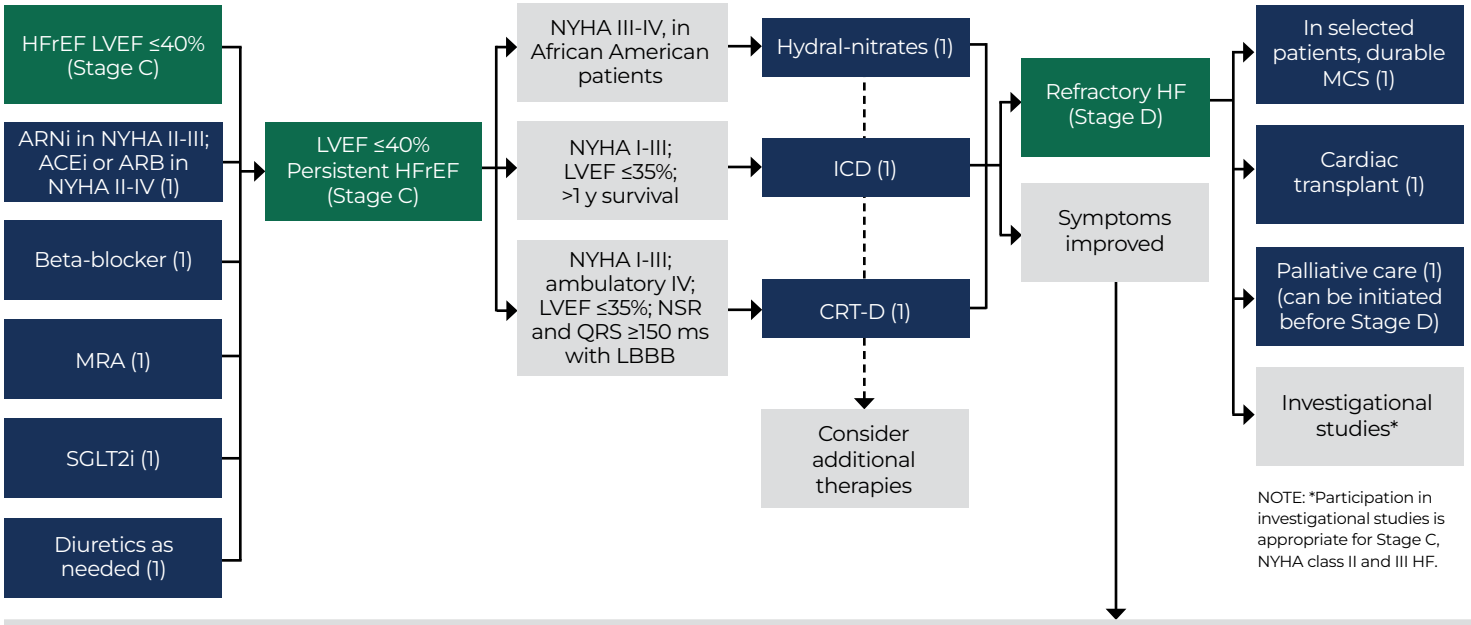
**STEP 2** Titrate to target dosing as tolerated, labs, health status, and LVEF

**STEP 3** Consider these patient scenarios

**STEP 4** Implement additional GDMT and device therapy, as indicated

**STEP 5** Reassess symptoms, labs, health status, and LVEF

**STEP 6** Referral for HF specialty care for additional therapy




NOTE: *Participation in investigational studies is appropriate for Stage C, NYHA class II and III HF.

**Continue GDMT with serial reassessment and optimize dosing, adherence, and patient education; address goals of care**

**HFmrEF (HF with mildly reduced EF) = LVEF 41%-49%**
Evidence of spontaneous or provokable increased LV filling pressures
(eg, elevated natriuretic peptide, noninvasive and invasive hemodynamic measurement)

(1) Indicates a Class 1 (Strong) recommendation. ACEi = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; ARNi = angiotensin receptor-neprilysin inhibitor; CRT-D = cardiac resynchronization therapy device; ED = emergency department; GDMT = guideline-directed medical therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; hydral-nitrates = hydralazine and isosorbide dinitrate; ICD = implantable cardioverter-defibrillator; IV = intravenous; LBBB = left bundle branch block; LVEF = left ventricular ejection fraction; MCS = mechanical circulatory support; MRA = mineralocorticoid receptor antagonist; NSR = normal sinus rhythm; NYHA = New York Heart Association; PAP = pulmonary artery pressure; QoL = quality of life; RAS = renin–angiotensin system; SCD = sudden cardiac death; SGLT2(i) = sodium-glucose cotransporter 2 (inhibitor); VAD = ventricular assist device. Metra M, et al. *Eur J Heart Fail.* 2023;25:776-791; McDonagh TA, et al. *Eur Heart J.* 2023;44(37):3627-3639; Heidenreich PA, et al. *Circulation.* 2022;145:e876-e894.


This pocket guide is supported by an educational grant from Merck & Co., Inc.
Halting the Spiral in Worsening Heart Failure With HFrEF: A Pocket Guide. 10.2024

**For the complete AHA/ACC/HFSA Guidelines, scan the QR code**

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## Additional Medical Therapies After Optimizing GDMT

| | |
|---|---|
| **Ivabradine** (2a) | *In patients with LVEF ≤35% with NYHA II-III; NSR with HR ≥70 bpm at rest on maximally tolerated beta-blockers*<br>✓ Initial dose: 5 mg BID<br>✓ Target dose: 7.5 mg BID |
| **Vericiguat** (2b) | *In patients with LVEF ≤45%; recent HFH or IV diuretics; elevated NP levels*<br>✓ Initial dose: 2.5 mg daily<br>✓ Target dose: 10 mg daily |
| **Digoxin** (2b) | *In patients with symptomatic HF despite GDMT or unable to tolerate GDMT*<br>✓ Initial dose: 0.125-0.25 mg QID<br>✓ Target dose: titrate to achieve serum concentration 0.5-0.9 ng/mL |
| **PUFA** (2b) | *In patients with HF and NYHA II-IV*<br>Dose: 1 gram daily of n-3PUFA (850-880 mg of EPA and DHA) |
| **Potassium binders** (2b) | *In HF patients with hyperkalemia (≥5.5 mEq/L) while taking RAASi*<br>Medications: patiromer; sodium zirconium cyclosilicate |

## Comorbidity Management Recommendations in Patients With HFrEF

**(1) – Hypertension**

- Uptitrate GDMT to the maximally tolerated target dose

**(2a) – Anemia With or Without Iron Deficiency**

- Intravenous iron replacement is reasonable to improve functional status and quality of life

**3: Harm – Central Sleep Apnea**

- Adaptive servo-ventilation is harmful to NYHA class II to IV HFrEF patients

## High-risk features should trigger consideration for referral for an advanced HF consultation. Remember the acronym: I NEED HELP!

**I. N.E.E.D. H.E.L.P. stands for …**

**I**ntravenous inotropes

**N**YHA class IIIB/IV or persistently elevated natriuretic peptides
**E**nd-organ dysfunction
**E**F ≤35%
**D**efibrillator shocks

**H**ospitalizations >1
**E**dema despite escalating diuretics
**L**ow systolic BP ≤90, high heart rate
**P**rognostic medication; progressive intolerance or down-titration of GDMT

| | |
|---|---|
| (1) indicates a Class 1 (Strong) recommendation | (2b) indicates a Class 2b (Weak) recommendation |
| (2a) indicates a Class 2a (Moderate) recommendation | 3: Harm indicates the approach is harmful; **not** recommended |

BID = twice daily; bpm = beats per minute; DHA = docosaexaenoic acid; EPA = eicosapentaenoic acid; GDMT = guideline-directed medical therapy; HF = heart failure; HFH = heart failure hospitalization; HR = heart rate; IV = intravenous; LVEF = left ventricular ejection fraction; NP = natriuretic peptide; NSR = normal sinus rhythm; NYHA = New York Heart Association; PUFA = polyunsaturated fatty acid; RAASi = renin-angiotensin-aldosterone system inhibitors; QID = 4 times daily. Heidenreich PA, et al. *Circulation*. 2022;145:e876-e894; Maddox TM, et al. *JACC*. 2024;83(15):1444-1488.


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