Heart Failure · Algorithm

Heidenreich PA, Bozkurt B, Aguilar D, et al. 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. J Am Coll Cardiol. 2022;79(17):e263-e421.

1 Stages of HF

STAGE	DEFINITION & CRITERIA
A — At risk	Risk factors (HTN, atherosclerotic CVD, diabetes, metabolic syndrome/obesity, cardiotoxic exposure, FHx/genetic cardiomyopathy) — no symptoms, no structural disease, no biomarker elevation
B — Pre-HF	No symptoms/signs, **but** structural heart disease (reduced EF/strain, LVH, chamber enlargement, wall motion abnormality, VHD) **or** elevated filling pressures **or** risk factors + elevated natriuretic peptide/troponin (no competing cause)
C — Symptomatic	Structural heart disease with current or previous HF symptoms
D — Advanced	Marked symptoms interfering with daily life, recurrent hospitalizations despite optimized GDMT

2 Classification by LVEF

CATEGORY	CRITERIA
HFrEF	LVEF ≤ 40%
HFimpEF	Previous LVEF ≤40% with follow-up LVEF >40% — continue HFrEF-directed GDMT
HFmrEF	LVEF 41–49%
HFpEF	LVEF ≥ 50%

3 Biomarkers — Diagnosis & Risk Stratification

COR I	Dyspnea of unclear cause: BNP or NT-proBNP supports diagnosis or exclusion of HF.
COR I	Chronic HF: BNP/NT-proBNP recommended for risk stratification.
COR I	Hospitalized for HF: BNP/NT-proBNP at admission recommended to establish prognosis.
COR IIa	At risk of HF (Stage A/B): NP-based screening + team-based care can prevent progression to LV dysfunction/overt HF.
COR IIa	Predischarge BNP/NT-proBNP can inform trajectory and post-discharge prognosis.

NP levels are higher sensitivity than specificity — more useful to rule OUT than rule IN HF; obesity lowers levels and reduces sensitivity.

Class I — Strong · Class IIa — Moderate · Class IIb — Weak · Class III — No benefit/Harm

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LVEF ≤40% — initiate all four classes promptly; sequence for tolerability, not in series over months

1 RAAS Inhibition — ARNI > ACEi > ARB

COR I — NYHA II–III: **ARNI** (sacubitril/valsartan) recommended to reduce morbidity/mortality.

COR I — **ACEi** beneficial when ARNI not feasible; **ARB** recommended if ACEi-intolerant (cough/angioedema) and ARNI not feasible.

COR I — Already tolerating ACEi/ARB (NYHA II–III)? **Switch to ARNI** for further benefit.

III: Harm — Never combine ARNI with ACEi, or start ARNI within **36 hours** of last ACEi dose. Never give ARNI or ACEi with any history of angioedema.

2 Beta-Blockers

COR I — One of 3 mortality-proven agents only: **bisoprolol, carvedilol, or sustained-release metoprolol succinate** — not a class effect.

3 Mineralocorticoid Receptor Antagonist (MRA)

COR I — NYHA II–IV: spironolactone or eplerenone if **eGFR >30** and **K^+ <5.0** mEq/L; monitor K^+/renal function closely.

III: Harm — Discontinue if K^+ cannot be kept <5.5 mEq/L — life-threatening hyperkalemia risk.

4 SGLT2 Inhibitor

COR I — Symptomatic chronic HFrEF: SGLT2i recommended to reduce HF hospitalization & CV mortality — **regardless of diabetes status**.

5 Add-On / Second-Line Therapy

AGENT	COR	USE WHEN
Hydralazine + isosorbide dinitrate	I	Self-identified Black patients, NYHA III–IV on optimal GDMT (add-on)
Hydralazine + isosorbide dinitrate	IIb	Cannot take ARNI/ACEi/ARB (intolerance or renal insufficiency)
Ivabradine	IIa	NYHA II–III, LVEF ≤35%, sinus rhythm, HR ≥70 bpm on max-tolerated beta-blocker
Vericiguat	IIb	High-risk, recent HF worsening despite GDMT
Digoxin	IIb	Symptomatic despite GDMT (or GDMT-intolerant) — reduces hospitalizations, not mortality

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LVEF 41–49% (mildly reduced) and ≥50% (preserved)

1 HFmrEF (LVEF 41–49%)

No dedicated RCTs — evidence extrapolated from HFrEF trial subgroups; lower end of the range behaves more like HFrEF.

COR IIa	SGLT2i can be beneficial — decreases HF hospitalizations and CV mortality.
COR IIb	Evidence-based beta-blockers, ARNI/ACEi/ARB, and MRA may be considered — particularly at the lower end of the EF range.

2 HFpEF (LVEF ≥50%)

Up to 50% of all HF; heterogeneous syndrome driven by comorbidities — treat the comorbidities as much as the EF.

COR I	Titrate BP to guideline targets to prevent morbidity.
COR IIa	SGLT2i can be beneficial — decreases HF hospitalizations and CV mortality.
COR IIa	Manage concomitant AF — can improve symptoms.
COR IIb	MRA, ARB, or ARNI may be considered to decrease hospitalizations — particularly at the lower end of the EF range.
III: No Benefit	Routine nitrates or PDE-5 inhibitors to increase activity/QOL — not effective.

3 Don't Miss

LOOK FOR A TREATABLE CAUSE OF HFPEF

- Cardiac amyloidosis (esp. with LVH, low-flow/low-gradient AS, carpal tunnel, polyneuropathy) — pursue technetium pyrophosphate scintigraphy + serum/urine free light chains
- Uncontrolled hypertension, CAD, obesity, AF — comorbidity-driven phenotype

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Reassess LVEF on optimized GDMT before device decisions; expect >1 year meaningful survival

1 ICD — Primary Prevention of SCD

- **COR I** — Nonischemic DCM or ischemic ≥40 days post-MI, LVEF ≤35%, NYHA II–III on GDMT → ICD to reduce total mortality.
- **COR I** — ≥40 days post-MI, LVEF ≤30%, NYHA I on GDMT → ICD to reduce total mortality.
- **COR IIa** — Genetic arrhythmogenic cardiomyopathy + high-risk features, EF ≤45% → ICD reasonable.
- **III: No Benefit** — Comorbidities/frailty limiting survival to <1 year → ICD and CRT-D not indicated.

2 CRT — By QRS Morphology & Duration (all: LVEF ≤35%, sinus rhythm, on GDMT)

QRS MORPHOLOGY	QRS DURATION	NYHA CLASS	COR
LBBB	≥150 ms	II, III, ambulatory IV	I
LBBB	120–149 ms	II, III, ambulatory IV	IIa
Non-LBBB	≥150 ms	II, III, ambulatory IV	IIa
Non-LBBB	120–149 ms	III, ambulatory IV	IIb
Ischemic, LBBB, LVEF ≤30%	≥150 ms	I	IIb
Any	<120 ms	Any	III
Non-LBBB	<150 ms	I, II	III

3 Other CRT Indications

- **COR IIa** — High-degree/complete heart block + LVEF 36–50% → CRT reasonable.
- **COR IIa** — AF + LVEF ≤35% on GDMT, if AV nodal ablation/rate control will allow ~100% CRT pacing → CRT useful.
- **COR IIa** — New/replacement device with anticipated >40% ventricular pacing, LVEF ≤35% on GDMT → CRT useful.

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