

OHSU

Getting HFrEF Right: Evidence-Based Outpatient Care for PCPs

Smriti Ohri MD FAAFP

Associate Professor

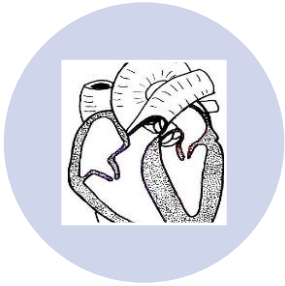
Department of Family Medicine
Oregon Health & Science University

Feb 9, 2026

CCPD



Objectives



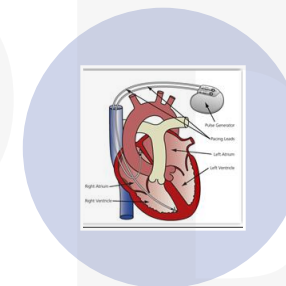
Identify and stage HF using clinical findings, echocardiography, and guideline-based classifications



Initiate guideline-directed medical therapy (GDMT) for HFrEF



Optimize sequencing, titration, and monitoring of the four foundational medication classes



Recognize indications for advanced therapies and referral

Case #1

- 62 y/o M with HTN and T2D presents with exertional dyspnea. Echo shows LVEF 30%. BP 118/72, HR 82, Cr 1.1 (eGFR 65), K 4.3. He is mildly volume overloaded. Which of the following is the most appropriate initial outpatient management strategy?
 - A. Start a beta-blocker and uptitrate before adding other agents
 - B. Start loop diuretic alone and reassess in 4–6 weeks
 - C. Start ARNi (or ACEi/ARB) plus SGLT2 inhibitor and a loop diuretic
 - D. Refer to cardiology before starting therapy

Case #2

- 66 y/o M with HFrEF (LVEF 28%) and CKD stage 3a (eGFR 42) is not on an MRA. K=4.9
Which statement is most accurate?

- A. MRAs are contraindicated due to CKD
- B. MRAs can be started with close monitoring
- C. MRAs provide only symptomatic benefit
- D. MRA should be delayed until EF improves

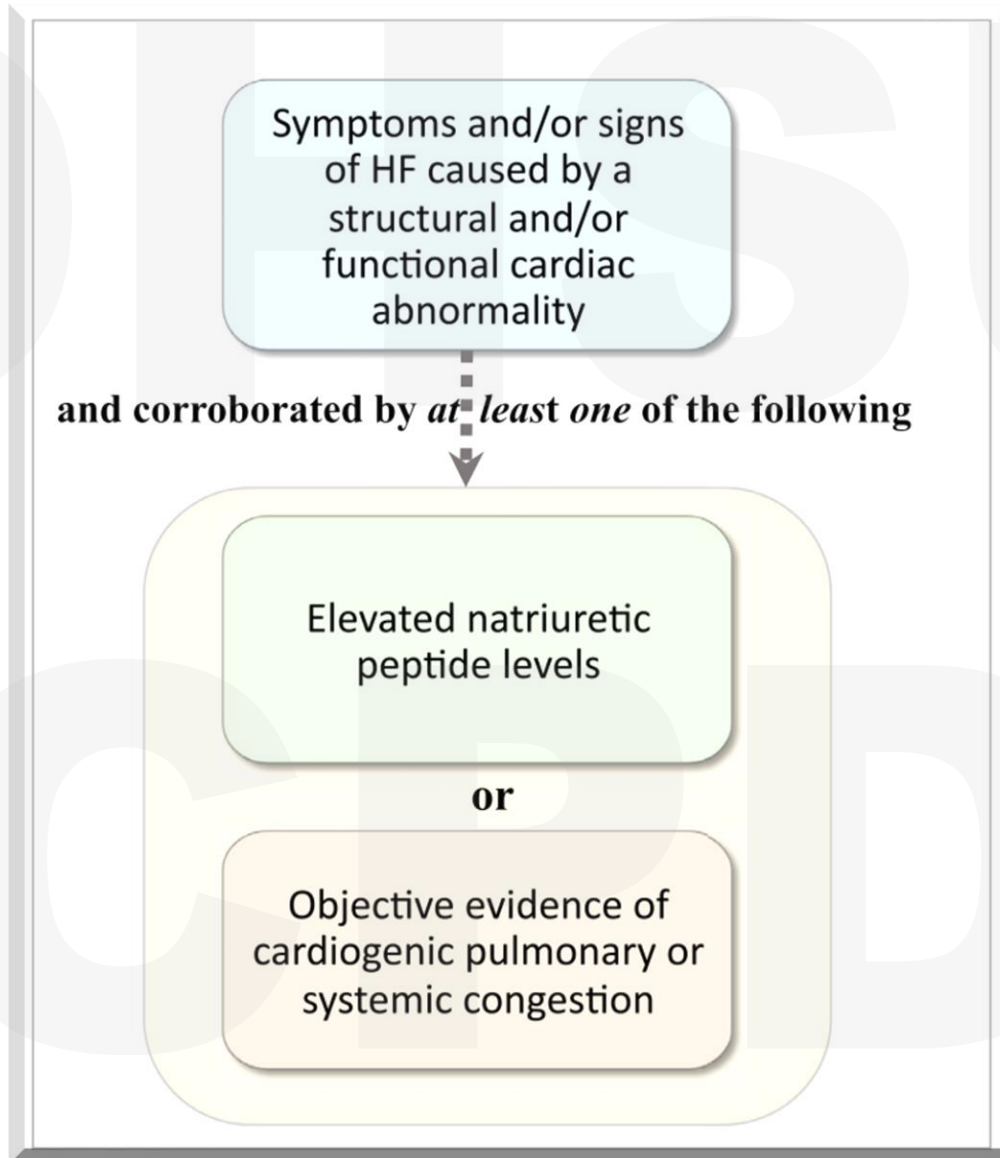
Case #3

58 y/o F with prior HFrEF (EF 30%) now has EF 55% after 18 months of GDMT and is asymptomatic.

What is the best management approach?

- A. Gradually stop HF medications
- B. Continue GDMT indefinitely
- C. Stop beta-blocker and MRA
- D. Continue diuretic only

Definition



ACC/AHA Stages of HF

Stage A

“At risk”

- * No current or previous signs or symptoms
- * No structural or functional heart disease
- * No abnormal biomarkers

HTN, ASCVD, DM, metabolic syndrome, obesity, cardiotoxic agents, genetic cardiomyopathy

ACC/AHA Stages of HF

Stage A

“At risk”

- * No current or previous signs and symptoms
- * No structural or functional heart disease
- * No abnormal biomarkers

Stage B

“Pre HF”

- * No current or previous signs and symptoms
- * Evidence of either:
 - Structural heart disease or
 - Increased filling pressures or
 - Risk factors + increased biomarkers

Structural heart disease:

- *Reduced LV or RV SF*
- *Ventricular hypertrophy, Chamber enlargement*
- *Wall motion abnormalities*
- *Valvular heart disease*

Evidence for increased filling pressures: by invasive hemodynamic measurements or by noninvasive imaging (ECHO)

ACC/AHA Stages of HF

Stage A

“At risk”

- * No current or previous signs and symptoms
- * No structural or functional heart disease
- * No abnormal biomarkers

Stage B

“Pre HF”

- * No current or previous signs and sx of HF
- * Evidence of either:
 - Structural heart disease or
 - Increased filling pressures or
 - Risk factors + increased biomarkers

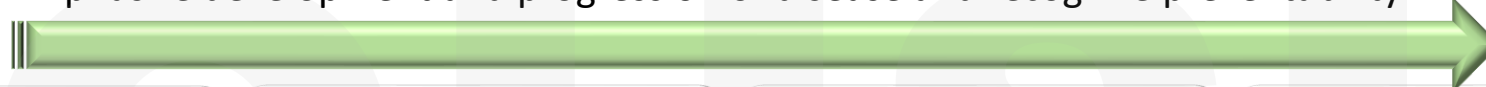
Stage C

“Symptomatic HF”

- * Current or previous signs and symptoms of HF

ACC/AHA Stages of HF

Emphasize development and progression of disease and recognize preventability



Stage A

“At risk”

- * No current or previous signs and symptoms
- * No structural or functional heart disease
- * No abnormal biomarkers

Stage B

“Pre HF”

- * No current or previous signs and symptoms
- * Evidence of either:
 - Structural heart disease or
 - Increased filling pressures or
 - Risk factors + increased biomarkers

Stage C

“Symptomatic HF”

- * Current or previous signs and symptoms

Stage D


“Advanced HF”

- * Marked symptoms that interfere with daily life and with recurrent hospitalizations despite GDMT

Stages vs NYHA Classes

ACCF/AHA Stages of HF		NYHA Functional Classification	
A	At high risk for HF but without structural heart disease or symptoms of HF.	None	
B	Structural heart disease but without signs or symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
C	Structural heart disease with prior or current symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
		II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
		III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
D	Refractory HF requiring specialized interventions.	IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.


Describe trajectory of symptoms and functional capacity for Stage C and D



Stages vs NYHA Classes

ACCF/AHA Stages of HF			
A	<div style="border: 1px solid black; background-color: #e6f2ff; padding: 5px; display: inline-block;">Treatment of risk factors</div>	<ul style="list-style-type: none"> Optimal control and management of HTN, CVD T2D: SGLT2i Regular physical activity, maintain normal weight, healthy diet, avoid smoking 	
B	Structural heart disease but without signs or symptoms of HF.		
C	Structural heart disease with prior or current symptoms of HF.		I Physical activity does not cause symptoms of HF.
			II Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
		III Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.	
D	Refractory HF requiring specialized interventions.	IV Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.	

Stages vs NYHA Classes

ACCF/AHA Stages of HF		NYHA Functional Classification		
A	At high risk for HF but without structural heart disease or symptoms of HF.	I	Asymptomatic	
B	<div data-bbox="428 349 1133 578" style="border: 1px solid black; border-radius: 15px; background-color: #ADD8E6; padding: 10px; display: inline-block;"> Treating risk and structural heart disease to prevent symptoms of HF </div> 	I	• CAD, h/o MI or ACS: statins to prevent symptomatic HF and adverse CV events	
C		Asymptomatic HF.	I	• MI and LVEF <40%: ACEi, BB
			II	• Valve replacement or repair for hemodynamically significant valvular stenosis or regurgitation
			III	
D	Refractory HF requiring specialized interventions.	IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.	

- CAD, h/o MI or ACS: statins to prevent symptomatic HF and adverse CV events
- MI and LVEF <40%: ACEi, BB
- Valve replacement or repair for hemodynamically significant valvular stenosis or regurgitation

Stages vs NYHA Classes

ACCF/AHA Stages of HF		NYHA Functional Classification	
A	At high risk for HF but without structural heart disease or symptoms of HF.	None	
B	Structural heart disease but without signs or symptoms of HF.	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
C	Structural heart disease with prior or current symptoms of HF.	I	No limitation of physical activity. Ordinary physical 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	Moderate to severe limitation of physical activity. Comfortable only at rest, but less than ordinary physical activity causes symptoms of HF.
		IV	Unable to carry on any physical activity without symptoms of HF at rest.
D	Refractory HF requiring intensive medical interventions.		

Reduction of symptoms, morbidity and mortality

Classification by LVEF

HFrEF

LVEF \leq 40%

HFimpEF

Previous LVEF \leq 40% and f/u is $>$ 40%

HFmrEF

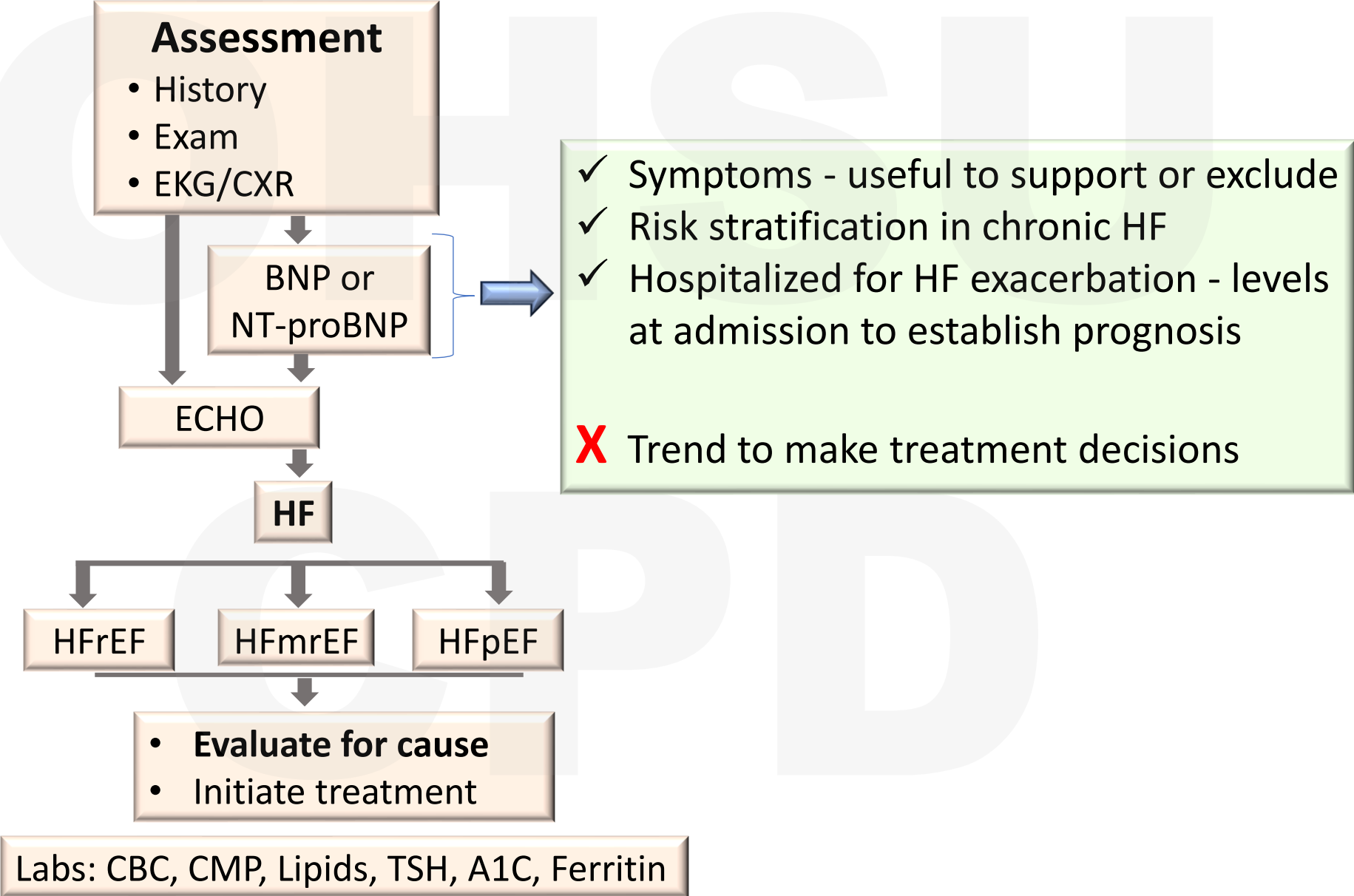
LVEF 41-49%

HFpEF

LVEF \geq 50%

→ Prevalence: at least 50% (trend increasing)

Diagnostic algorithm



Causes of HF

Most common causes:

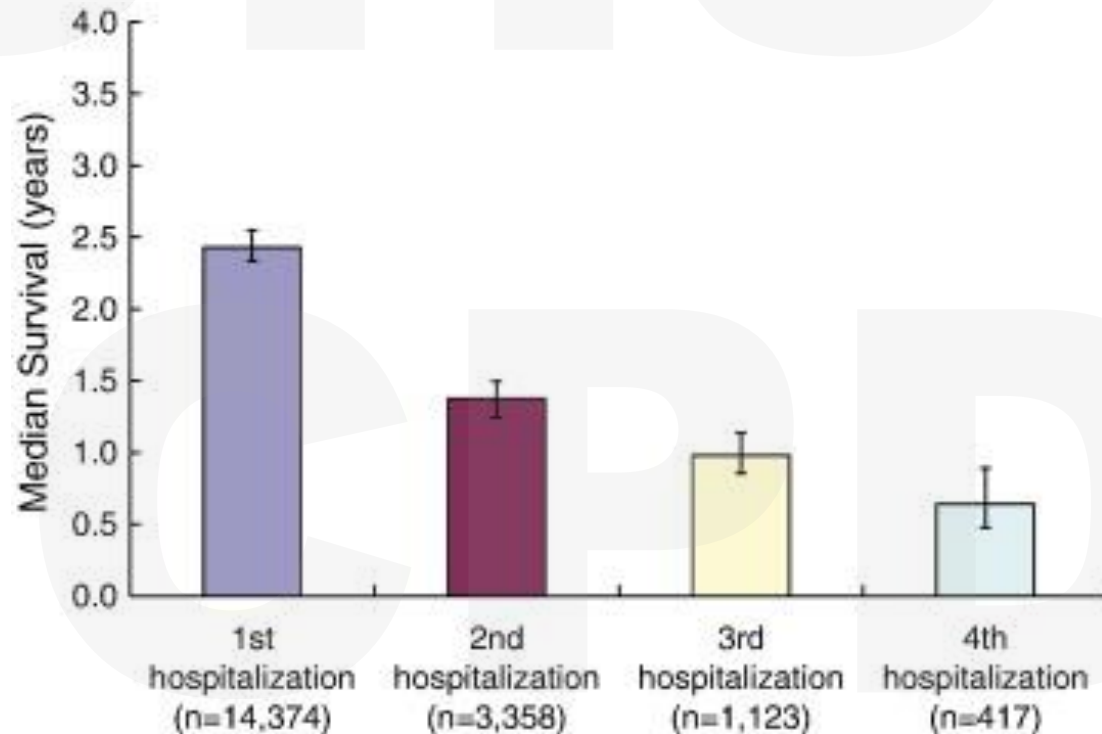
- Ischemic Heart Disease
- Hypertension
- Valvular Heart Disease

Other causes:

- Cardiac (arrhythmia, cardiomyopathies, myocarditis)
- Cardiotoxic agents (chemo, alcohol, cocaine, methamphetamine)
- Rheumatologic or autoimmune
- Endocrine or metabolic (thyroid, DM, obesity)

Outpatient management of HF

- Number of HF hospitalizations - strong predictor of mortality
- Each hospitalization for HF yields an increasing risk for 30-day and 1-year mortality

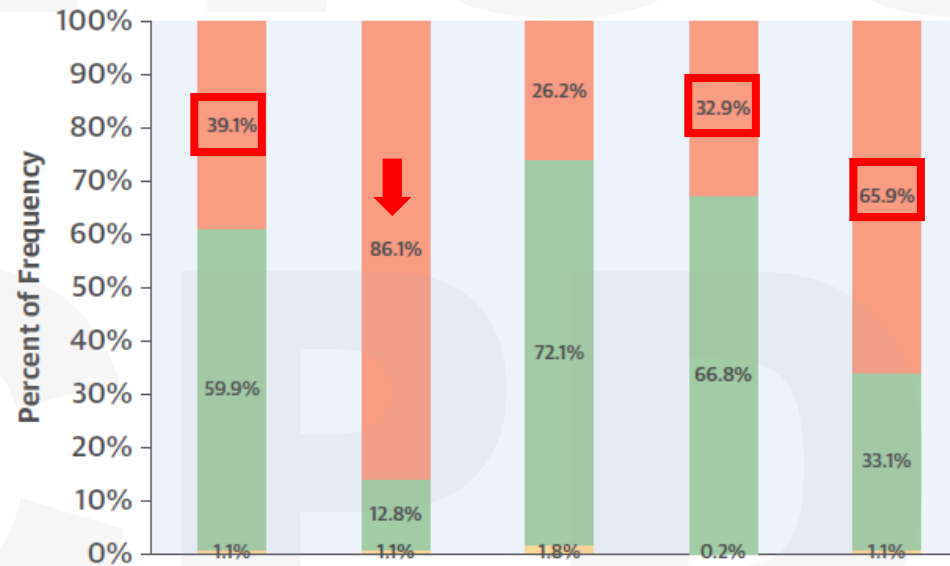


Pharmacological Management: Stage C- “Symptomatic HF”

- Address congestion → Diuretics: relieve congestion, improve symptoms, and prevent worsening
- Initiate and maintain GDMT

The CHAMP-HF Registry

Significant gaps in use and dose of GDMT



SGLT2i in HF

Empagliflozin
(EMPEROR-REDUCED)
(EMPEROR-PRESERVED)

Dapagliflozin
(DAPA-HF)
(DELIVER)

	ACEI/ARB	ARNI	ACEI/ARB/ ARNI	Beta- Blocker	MRA
Without Contraindication and Not Treated	1374	3029	920	1159	2317
Treated	2107	452	2536	2351	1163
With Contraindication	37	37	62	8	38

GDMT

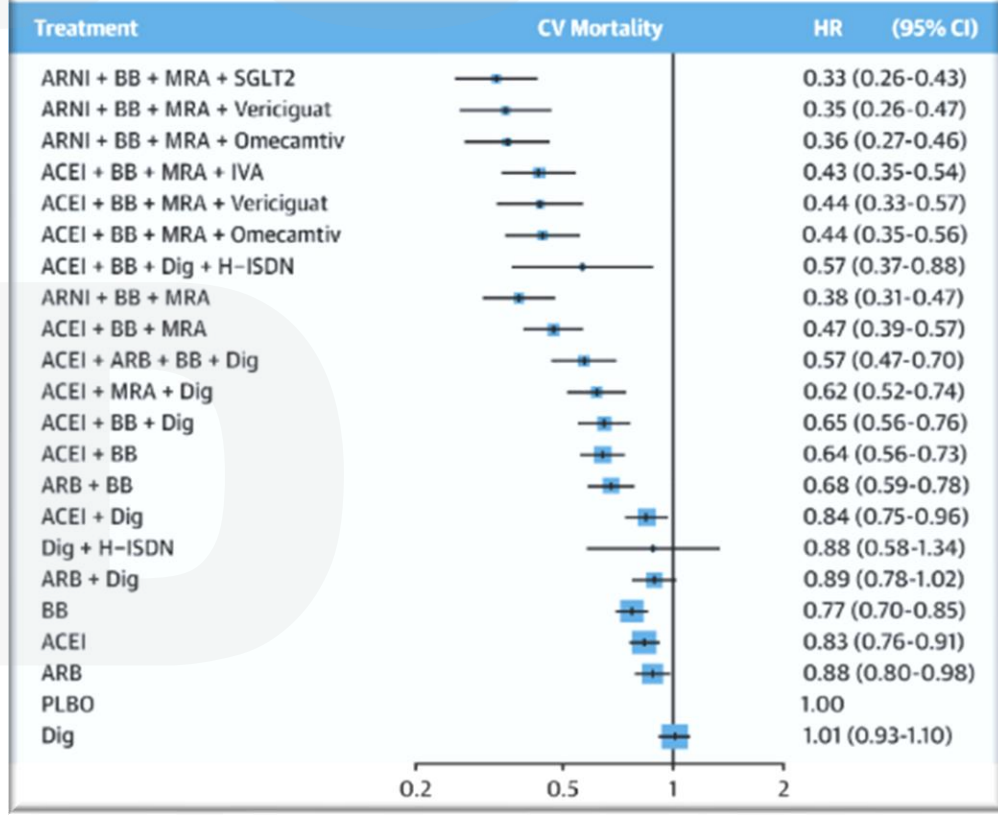
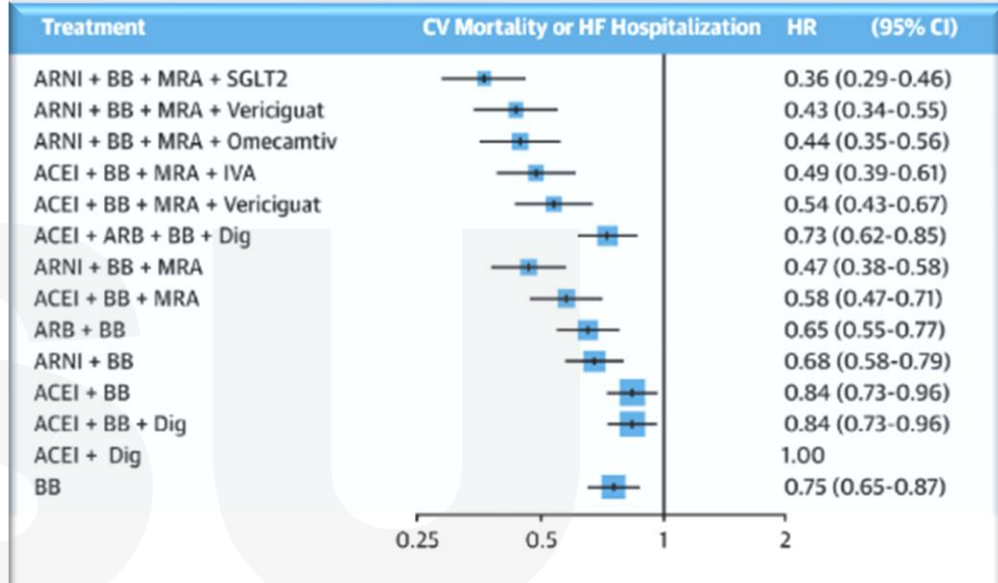
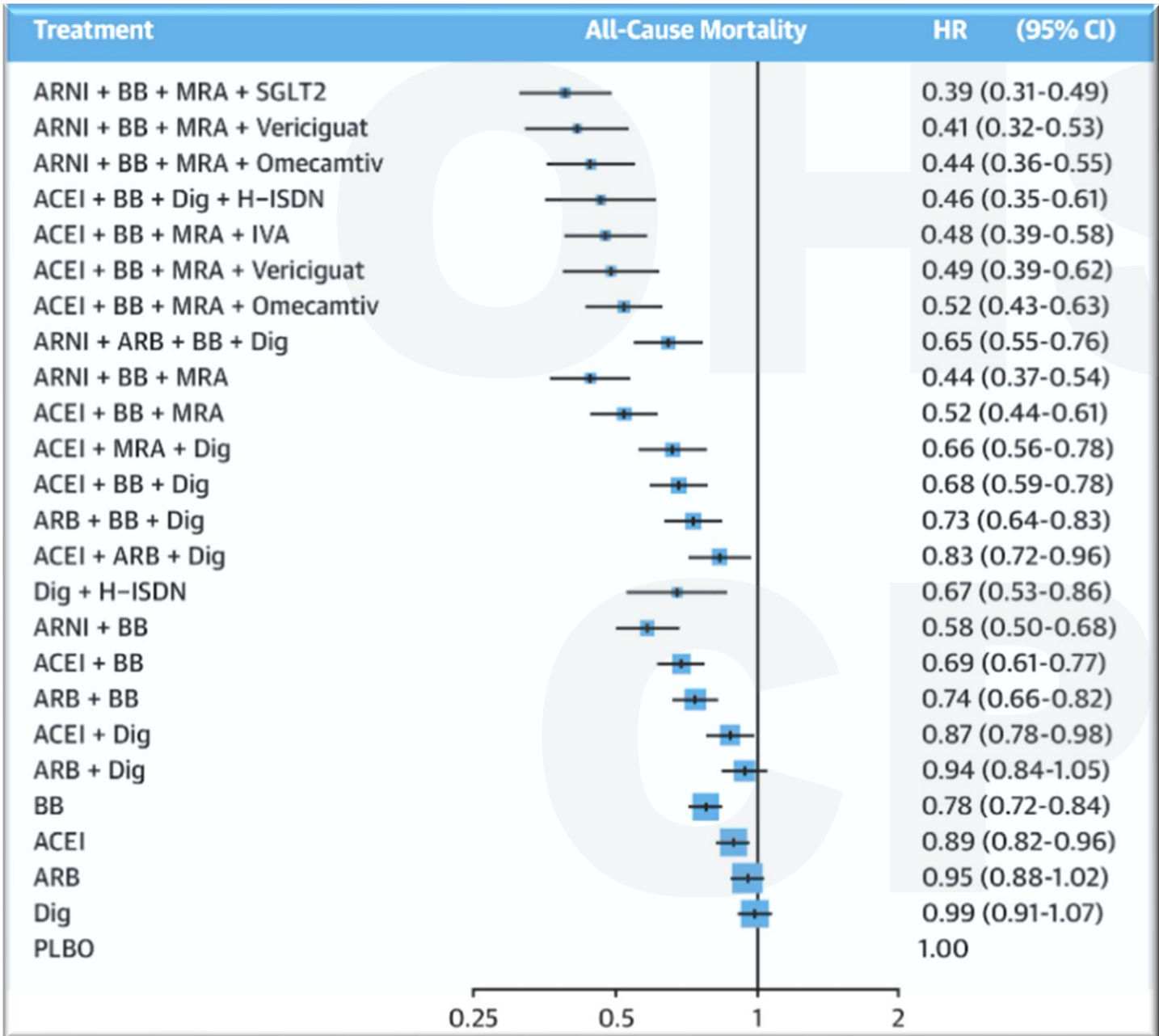
RAASi

BB

MRA

SGLT2i

Systematic review and network meta analysis, 75 trials 95,444 participants



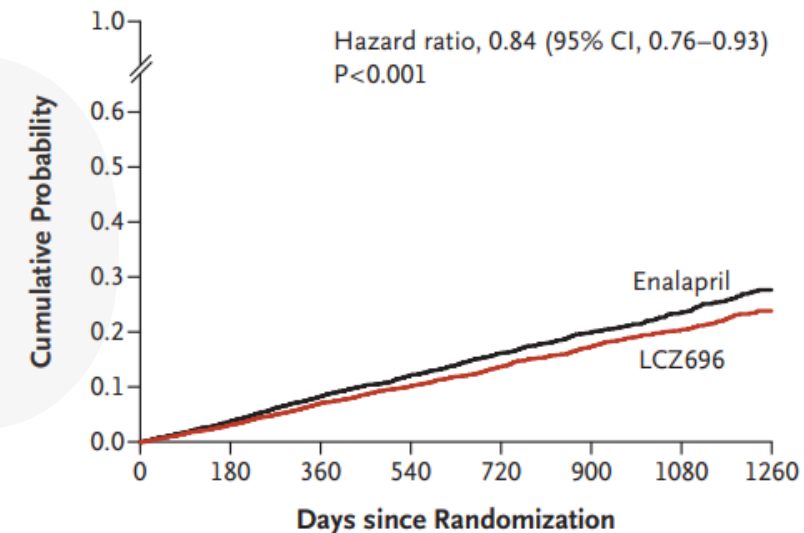
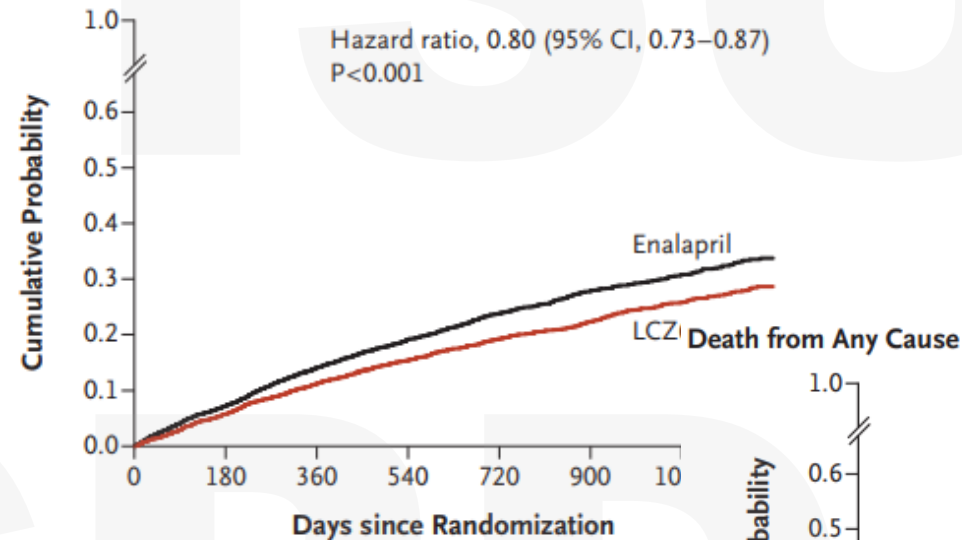
RAASi

PARADIGM-HF Trial

Angiotensin–Neprilysin Inhibition versus Enalapril in Heart Failure

HFrEF, NYHA Class II-IV

Primary End Point = CV mortality + HF hospitalization



ARNi

Unable to use ARNi → ACEi

Intolerance to ACEi (cough or angioedema) and use of ARNi not feasible → ARBs

NYHA class II or III- tolerating an ACEi/ ARB
→ replace by an ARNi to further reduce morbidity and mortality

ACEi

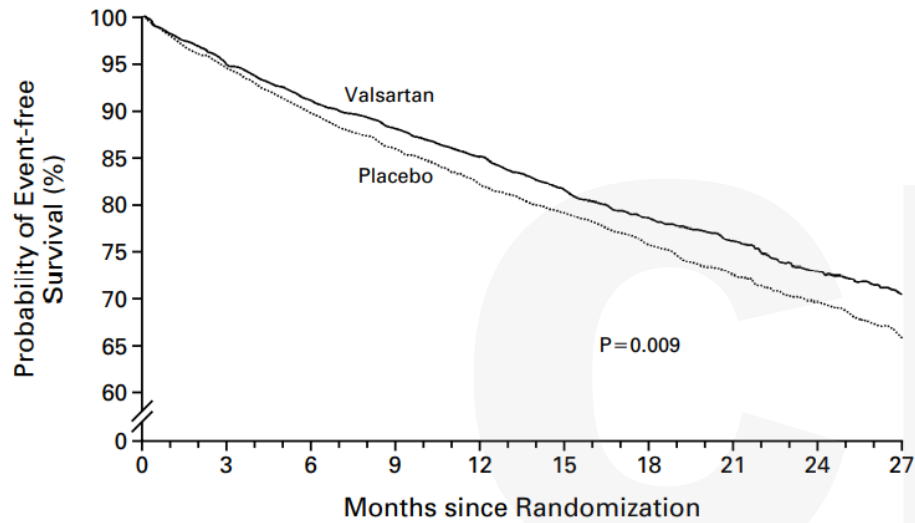
STUDY	INCLUSION	REGIMEN	RESULTS
CONSENSUS	N= 253 NYHA Class IV	Enalapril 20mg BID vs Placebo	Trial terminated early, 40% ↓ in overall mortality (P=0.002), significant improvement in functional class
SOLVD	N= 2569 NYHA Class I-IV, EF ≤ 35%	Enalapril 10mg BID vs Placebo	16% ↓ in overall mortality (P=0.0036), fewer hospitalization for worsening HF
ATLAS	N= 3164 NYHA Class II-IV EF ≤ 30%	Lisinopril (2.5-5mg) vs Lisinopril (35mg)	No difference in overall mortality, 24% fewer hospitalization
SAVE	N= 2231 AMI < 2 wks, EF ≤ 40%	Captopril 50mg BID vs Placebo	19% ↓ in overall mortality (P=0.019), significant ↓ in deaths from CV causes, HF, hospitalization for HF, recurrent MI
AIRE	N= 2006 AMI < 10d	Ramipril 5mg BID vs Placebo	27% ↓ in overall mortality (P=0.002), significant decrease in incidence of severe HF, MI, stroke
TRACE	N= 2026 AMI < 7 d,	Trandolapril 2mg QD vs Placebo	22% ↓ in overall mortality (P=0.001), ↓ risk for CV death, sudden death, severe HF.

ARB

VAL-HeFT Trial

HFrEF, NYHA Class II-IV

Combined End Point= all cause mortality, cardiac arrest with resuscitation, hospitalization for worsening HF or therapy with IV inotropes or vasodilators



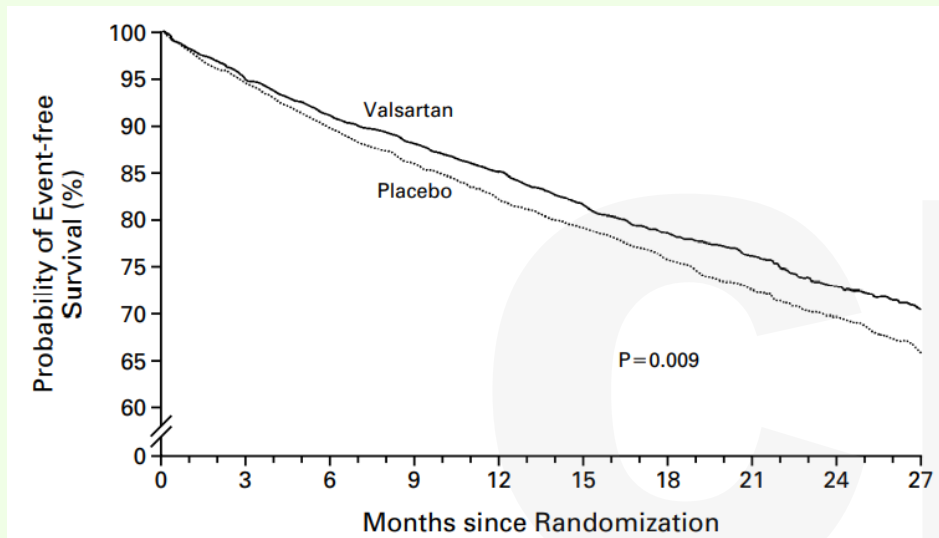
N Engl J Med 2001;345:1667-75

ARB

VAL-HeFT Trial

HFrEF, NYHA Class II-IV

Combined End Point= all cause mortality, cardiac arrest with resuscitation, hospitalization for worsening HF or therapy with IV inotropes or vasodilators

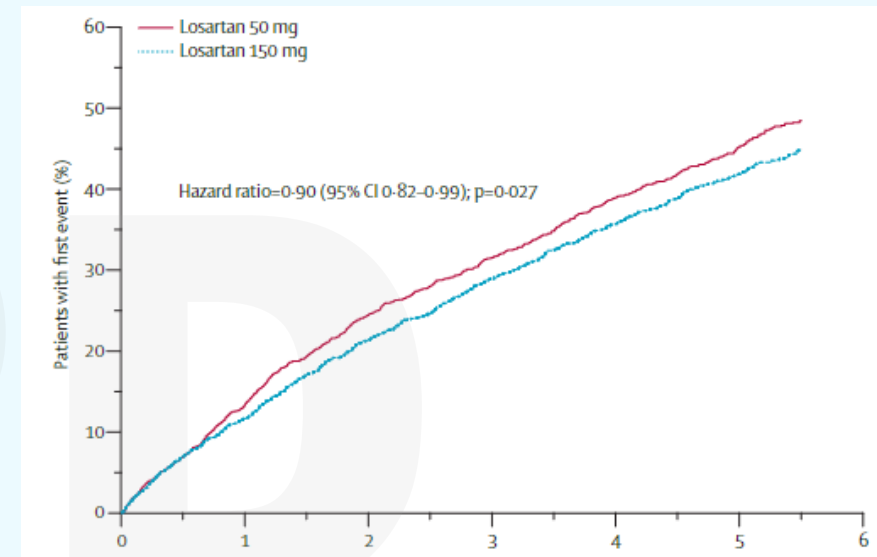


N Engl J Med 2001;345:1667-75

HEAAL Trial

HFrEF, NYHA Class II-IV

Primary endpoint= death or admission for HF



Lancet 2009; 374: 1840-48

ARNi/ ACEi/ARB Clinical pearls

ARNi

- Can be started even in ACEi naïve patients
- Do not administer
 - within 36 hours of last dose of ACEi
 - with any history of angioedema

ARB

- Do not inhibit kininase --> lower incidence of cough and angioedema

ACEi

- High incidence of cough/ angioedema
- Contraindicated with any h/o angioedema

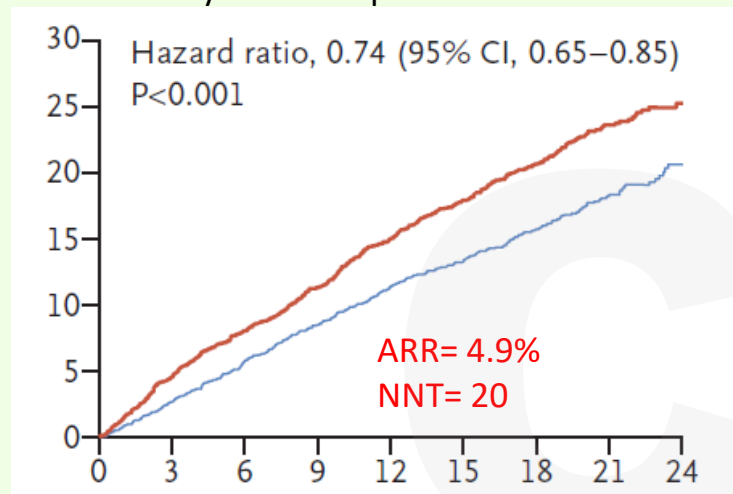
- Cautious with low BP, renal insufficiency, elevated K (≥ 5)
- If hypotension limits therapy, reduce **diuretic dose first** before stopping RAASi
- Expect a mild Cr increase ($\leq 30\%$ is acceptable)
- Start low, titrate to doses shown to reduce risk of CV events in clinical trials

SGLT2i

DAPA-HF Trial

HFrEF, NYHA Class II-IV

Primary end point= Composite of CV mortality or HF hospitalization



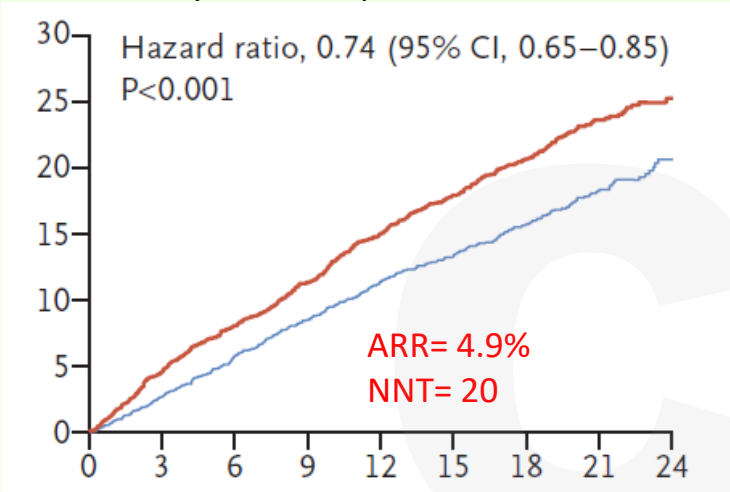
N Engl J Med. 2019;381(21):1995–2008

SGLT2i

DAPA-HF Trial

HFrEF, NYHA Class II-IV

Primary end point= Composite of CV mortality or HF hospitalization

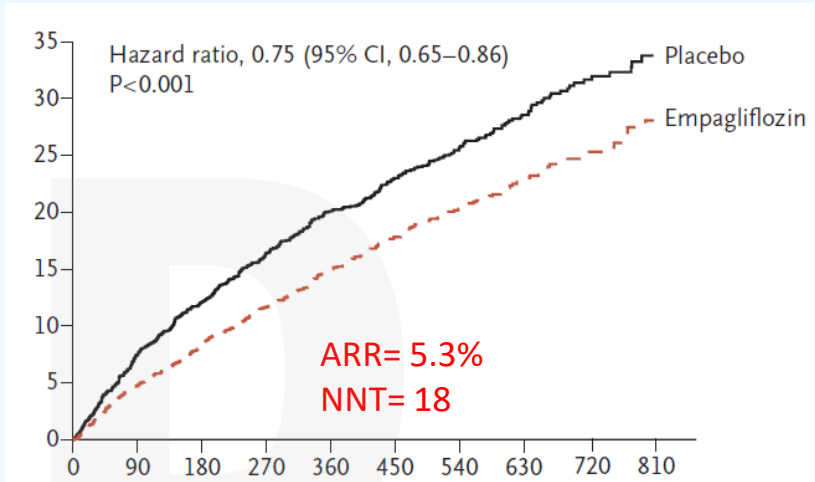


N Engl J Med. 2019;381(21):1995–2008

EMPEROR-REDUCED Trial

HFrEF, NYHA Class II-IV

Primary end point= Composite of CV mortality or HF hospitalization



N Engl J Med 2020;383:1413-24

SGLT2i Clinical pearls

Continue to use until GFR 20, even though glucose lowering effect blunted when GFR < 45, renal and CV benefits continue

Do not initiate GFR < 20

DKA risk (rare in DM2): should be d/ced before surgery (3-4 days), prolonged fasting or critical illness to avoid potential risk

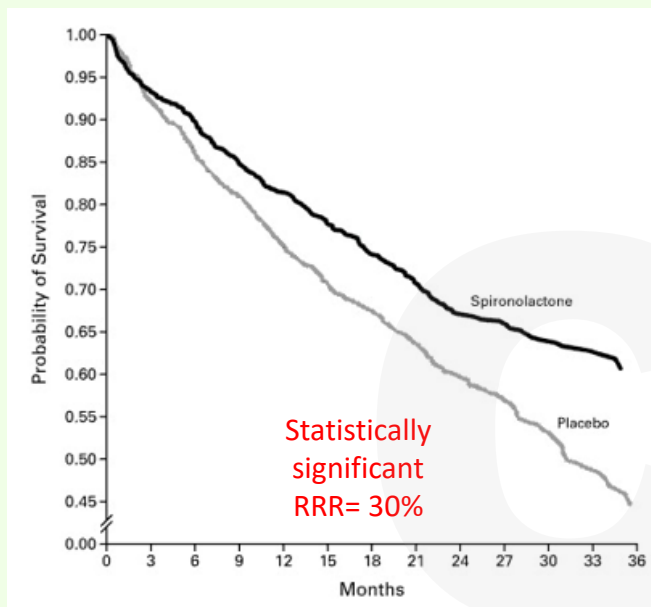
- GU infections
- Dehydration, Hypotension
- Fournier's gangrene (rare)

MRA

RALES Trial

HFrEF, NYHA Class III-IV

Primary end point= all cause mortality



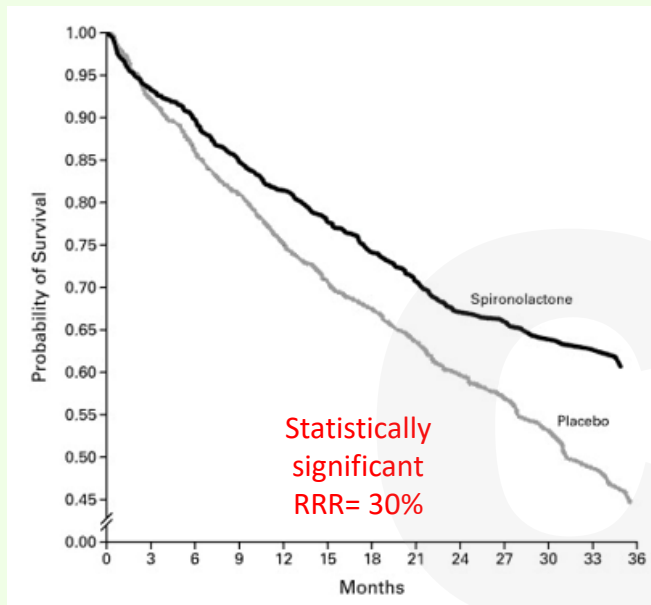
N Engl J Med 1999;341:709-717

MRA

RALES Trial

HFrEF, NYHA Class III-IV

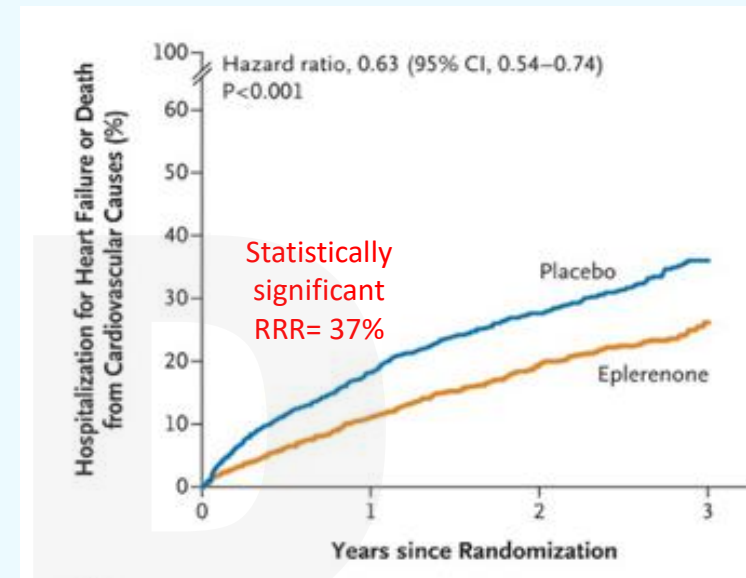
Primary end point= all cause mortality



N Engl J Med 1999;341:709-717

EMPHASIS-HF Trial

HFrEF, NYHA Class II



N Engl J Med 2011;364:11-21

MRA Clinical pearls

Criteria for use:

GFR > 30 K < 5

Closely monitor K and renal function; typically check in 3d and 1week after initiation and at least monthly for first 3 months

Even **low-dose spironolactone (12.5 mg)** provides benefit

Gynecomastia → switch to eplerenone rather than discontinuing therapy

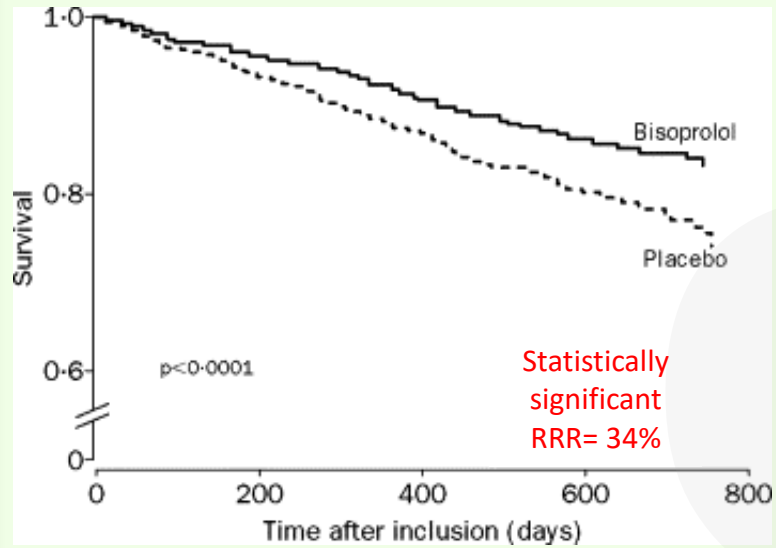
Reinforce avoidance of NSAIDs and potassium supplements

BB

CIBIS II Trial

HFrEF, NYHA Class III-IV

Primary end point= all cause mortality

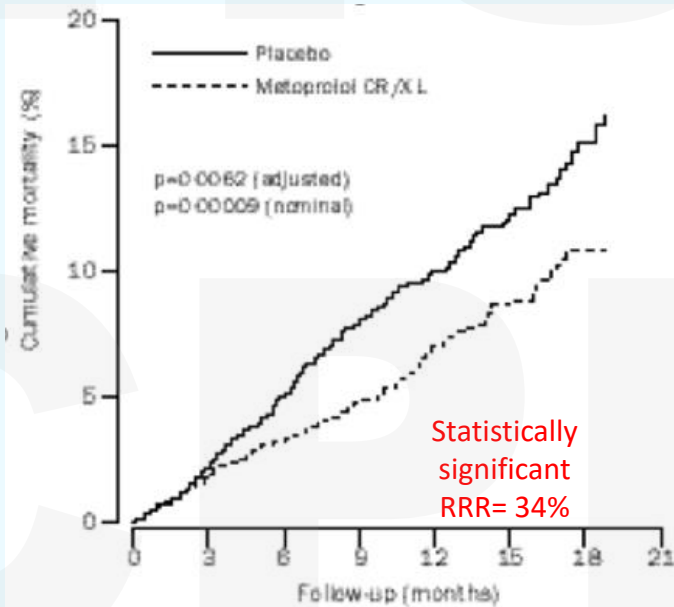


Lancet. 1999 Jan 2;353(9146):9-13

MERIT-HF Trial

HFrEF, NYHA Class II-IV

Primary end point= all cause mortality

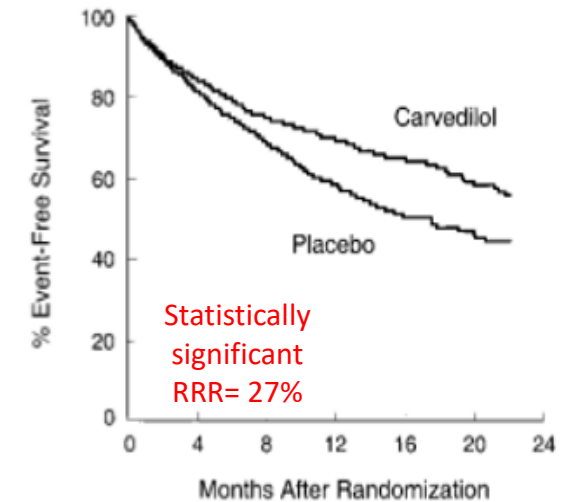


Lancet. 1999 Jun 12;353(9169):2001-7

COPERNICUS Trial

HFrEF, NYHA Class III-IV

Primary end point= all cause mortality



Circulation. 2002 Oct 22;106(17):2194-9

BB Clinical pearls

Only 3 BB improve survival

Start only when euvolemic

HR reduction- marker of effectiveness;
aim for resting HR ~55-70 if tolerated

Fatigue is common, may resolve within
2-4 weeks

GDMT clinical pearls

Sequential or Rapid initiation - individualized

Start low - uptitrate to a specified target dose (shown to be effective in major clinical trials) **irrespective of** improvement in symptoms at lower doses

If target dose cannot be achieved or tolerated - highest tolerated dose recommended

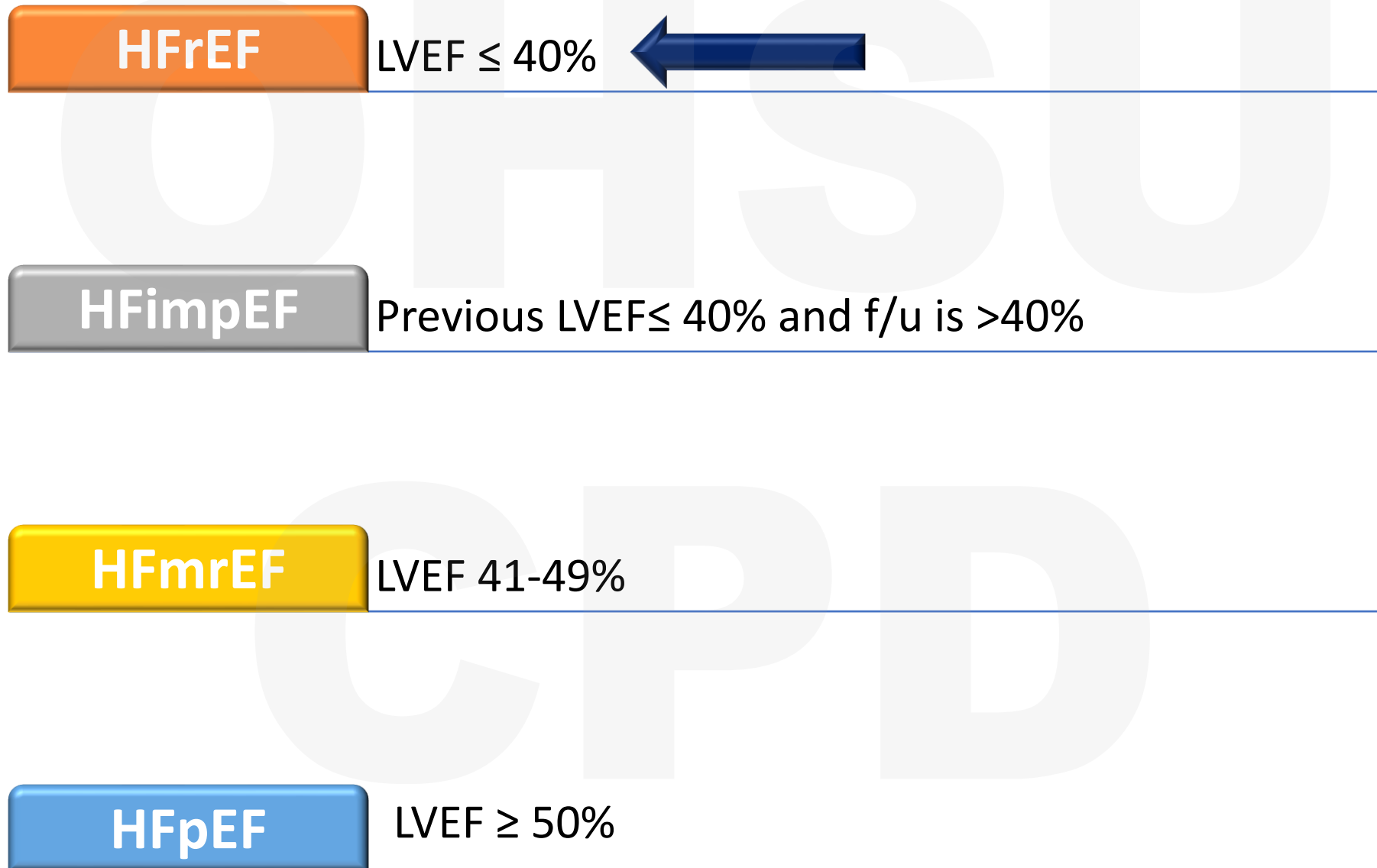
ARNi/ACEi/ARB potentially good initial med - feel good → MRA/SGLT2i

Avoid BB as initial med- especially if currently congested

GDMT clinical pearls

	Drug	Initial dose	Target dose
ACEi	Enalapril	2.5mg BID	10-20mg BID
	Lisinopril	2.5-5mg once daily	20-40mg once daily
ARB	Losartan	25-50mg once daily	50-150mg once daily
	Valsartan	20-40mg once daily	160mg twice daily
ARNi	Sacubitril-Valsartan	24-26 mg BID	97-103mg BID
BB	Carvedilol	3.125mg BID	25-50mg BID
	Metoprolol XL	12.5-25mg once daily	200mg once daily
MRA	Spironolactone	12.5-25mg once daily	25-50mg once daily
	Eplerenone	25mg once daily	50mg once daily

Classification by LVEF



Classification by LVEF

HFrEF

LVEF \leq 40%

HFimpEF

Previous LVEF \leq 40% and f/u is $>$ 40%



CONTINUE GDMT to prevent relapse of HF and LV dysfunction, even in patients who may become asymptomatic

TRED-HF Trial

Lancet 2019; 393: 61–73

Classification by LVEF

HFrEF

LVEF \leq 40%

HFimpEF

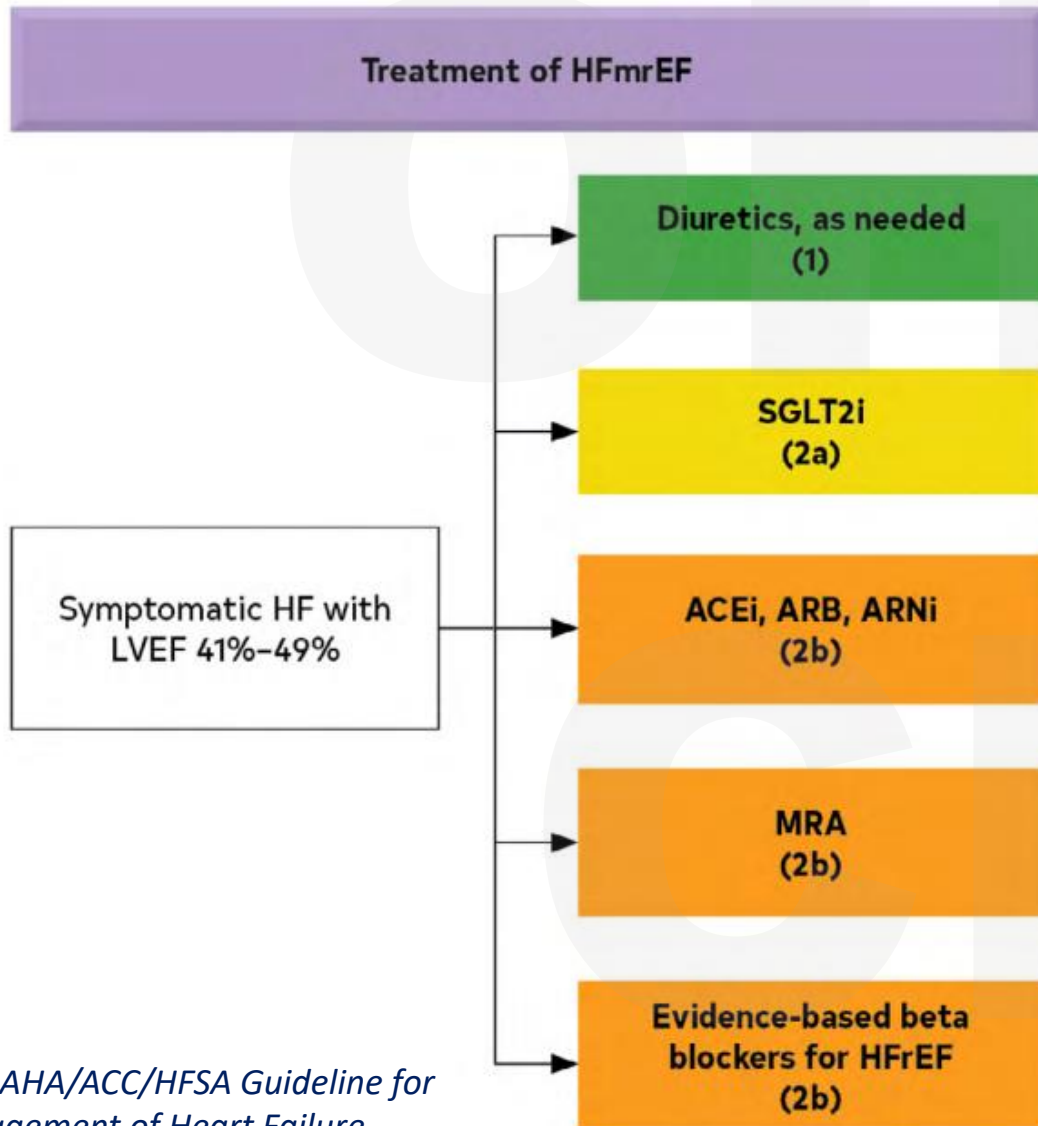
Previous LVEF \leq 40% and f/u is $>$ 40%

HFmrEF

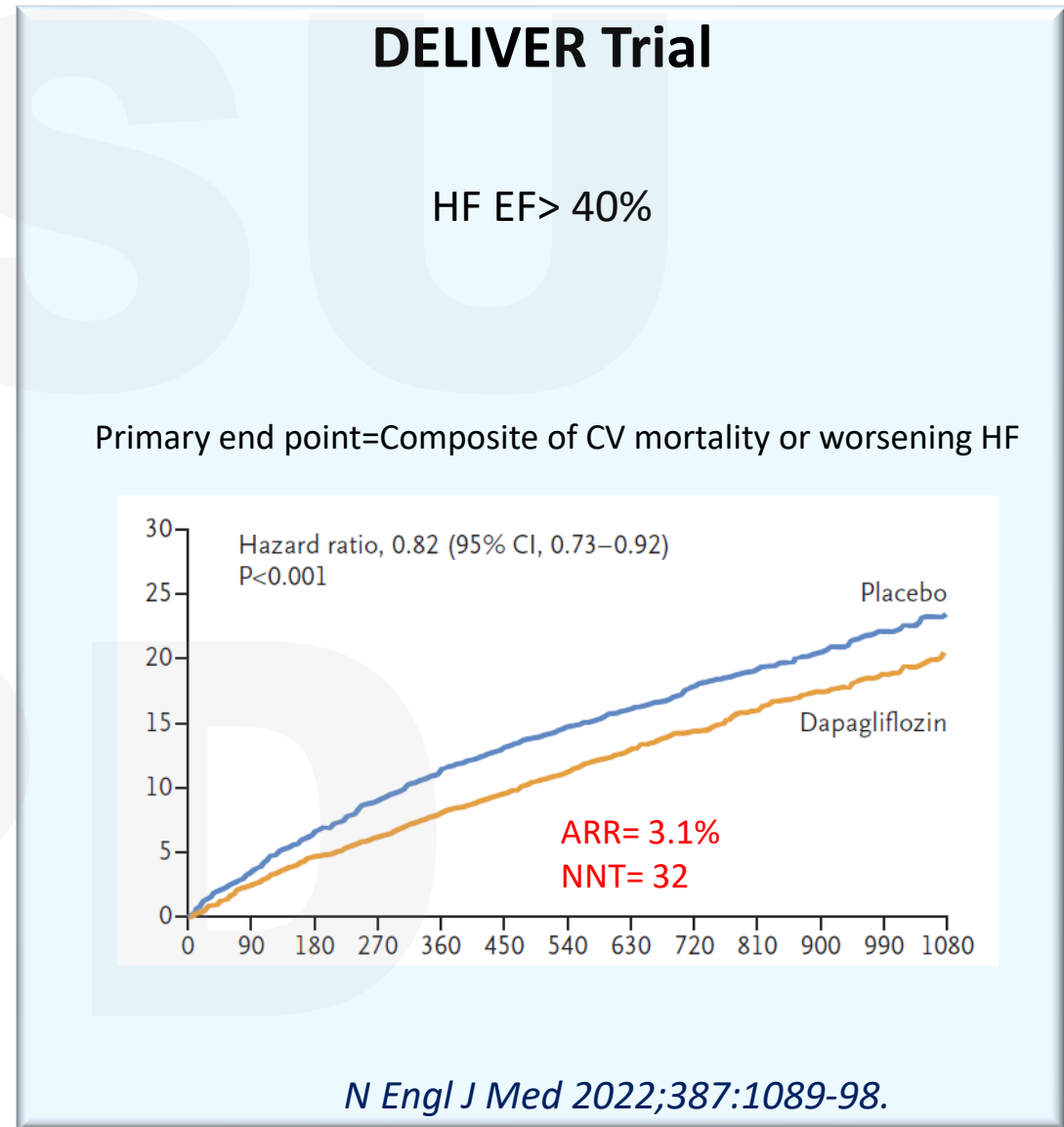
LVEF 41-49%



HFmrEF



2022 AHA/ACC/HFSA Guideline for Management of Heart Failure. *Circulation.* 2022;145:e895–e1032



Classification by LVEF

HFrEF

LVEF \leq 40%

HFimpEF

Previous LVEF \leq 40% and f/u is $>$ 40%

HFmrEF

LVEF 41-49%

HFpEF

LVEF \geq 50%



HFpEF

Treat the cause

- HTN
- Afib

SGLT2i: decrease HF hospitalizations and CV mortality

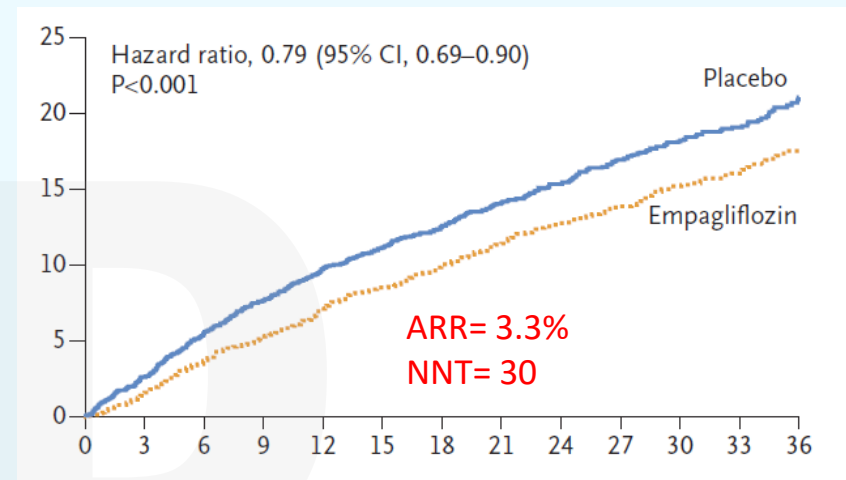
May consider to decrease hospitalization particularly with LVEF on the lower end

- MRA
- ARNi/ARB

EMPEROR-PRESERVED Trial

HF, mean EF >50% , NYHA Class II-IV

Primary end point= Composite of CV mortality or HF hospitalization



N Engl J Med 2021;385:1451-61

Other meds

ISDN+ Hydralazine

- HFrEF - symptomatic despite max tolerated GDMT
- Unable to tolerate GDMT due to s/e, hypotension, renal insufficiency

Ivabradine

- HFrEF - symptomatic despite GDMT, including BB at max tolerated dose, **and** who are in sinus rhythm with HR ≥ 70

Vericiguat

- HFrEF - symptomatic despite GDMT

Digoxin

- HFrEF - symptomatic despite GDMT
- Unable to tolerate GDMT

HFrEF and Iron deficiency

- With or without anemia → Consider IV iron replacement (improve functional status and QOL)
- Iron deficiency: defined as
 - Ferritin <100 µg/L
 - Ferritin 100-300 if transferrin saturation is <20%

FAIR-HF Trial

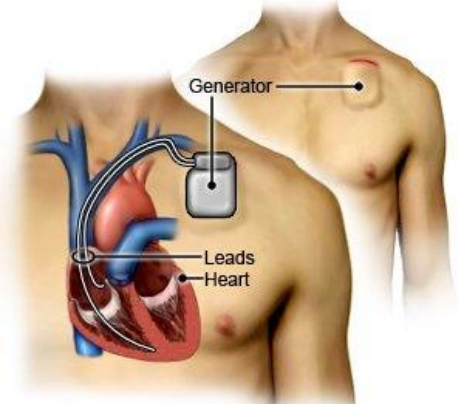
N Engl J Med 2009;361:2436-48

Treatment with IV ferric carboxymaltose in patients with HFrEF, NYHA Class II or III, and iron deficiency, with or without anemia, improves symptoms, functional capacity, and QOL

Device Therapy

Defibrillator

- NICM on GDMT *or*
- ICM (atleast 40d post MI)
NYHA Class II- III with LVEF ≤ 35%, have reasonable expectation of meaningful survival for >1 year
- ICM (atleast 40d post MI)
NYHA Class I with LVEF ≤ 30%, have reasonable expectation of meaningful



Implantable Cardiac Defibrillator (ICD)

BiVP

- CRT indicated to reduce mortality nad hospitalizations and improve symptoms and QOL in patients with
 - *NYHA Class II III and ambulatory IV despite GDMT (for 3 months) and*
 - *LVEF ≤ 35% and*
 - *LBBB with QRS ≥ 150ms*

Summary



Heart failure progression is preventable—early identification and treatment of Stage A and B disease reduces future morbidity and mortality



Every patient with HFrEF should be on the four pillars of GDMT, unless a clear contraindication exists



Initiate GDMT early and rapidly—clinical benefit begins within weeks, not months



Diuretics improve symptoms but not survival—they must be paired with disease-modifying therapy



Target doses matter, but the highest tolerated dose is acceptable when targets cannot be achieved




Stopping GDMT after EF recovery leads to relapse—therapy should be continued indefinitely



Primary care plays a central role in initiation, titration, monitoring, and coordination of HFrEF care


Case #1

- 62 y/o M with HTN and T2D presents with exertional dyspnea. Echo shows LVEF 30%. BP 118/72, HR 82, Cr 1.1 (eGFR 65), K 4.3. He is mildly volume overloaded. Which of the following is the most appropriate initial outpatient management strategy?
 - A. Start a beta-blocker and uptitrate before adding other agents
 - B. Start loop diuretic alone and reassess in 4–6 weeks
 -  C. Start ARNi (or ACEi/ARB) plus SGLT2 inhibitor and a loop diuretic
 - D. Refer to cardiology before starting therapy

Case #2

- 66 y/o M with HFrEF (LVEF 28%) and CKD stage 3a (eGFR 42) is not on an MRA. K=4.9
Which statement is most accurate?

A. MRAs are contraindicated due to CKD

 MRAs can be started with close monitoring

C. MRAs provide only symptomatic benefit

D. MRA should be delayed until EF improves

Case #3

58 y/o F with prior HFrEF (EF 30%) now has EF 55% after 18 months of GDMT and is asymptomatic.

What is the best management approach?

A. Gradually stop HF medications

 Continue GDMT indefinitely

C. Stop beta-blocker and MRA

D. Continue diuretic only

References

- 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure
- Non-acute heart failure management in primary care
BMJ 2024;384:e077057
- 2024 ACC Expert Consensus Decision Pathway for Treatment of Heart Failure With Reduced Ejection Fraction
JACC. 2024 Apr, 83 (15) 1444–1488.