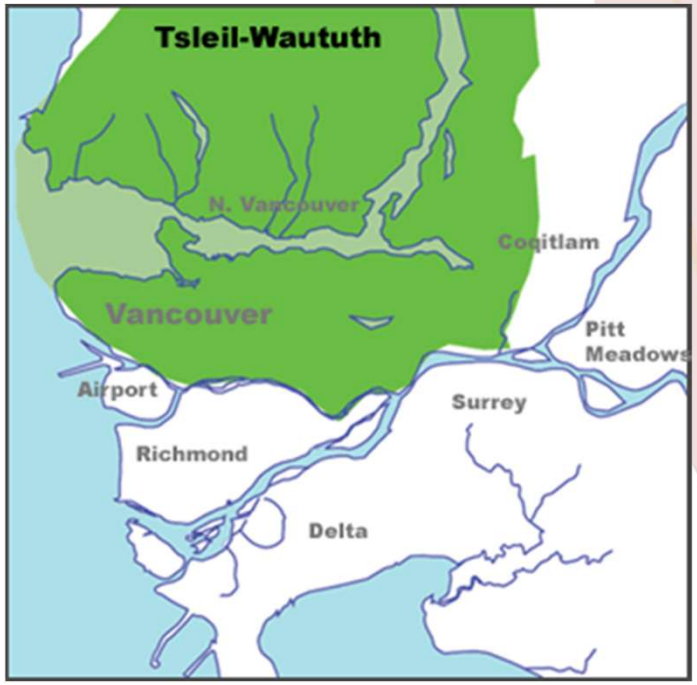
We would like to acknowledge that we are gathered today on the traditional territories of the Musqueam, Squamish and Tsleil-Waututh peoples.

Source: www.johomaps.net/na/canada/bc/vancouver/firstnations/firstnations.html



Heart Failure Toolkit for BC prescribers: initiating and titrating medications

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Centre for Cardiovascular Innovation
Centre d'Innovation Cardiovasculaire

Disclosure

- **Relationships with commercial interests:**
  - **Advisory Boards:** *NovoNordisk, Roche*
  - **Speakers Bureau/Honoraria:** *AstraZenica*
  - **Grants/Research Support:** *AstraZenica*
  - **Clinical Trial:** *AstraZenica*
  - **Other:** *None*

Disclosure of Financial Support

- I am not receiving any financial support to deliver today's presentation.

Mitigation of Potential Bias

- I will only use generic names of drugs; no bias perceived
- I will not discuss off label use
- I will only use peer-reviewed literature and national specialty society recommendations

Objectives

- Review the major types of heart failure with a focus on heart failure with reduced ejection fraction (HFrEF).
- Define guideline directed medical therapy (GDMT) for heart failure and its impact on patient outcomes.
- Describe provincial strategies to improve access to and uptake of GDMT for patients with heart failure.
- Introduce the Cardiac Services BC GDMT Toolkit and its role in supporting evidence based care.
- Identify practical actions primary care physicians can take to recognize, initiate, and optimize treatment for patients with HFrEF.

Toolkit for prescribing medications for HFrEF

Toolkit for prescribing medications for HFrEF

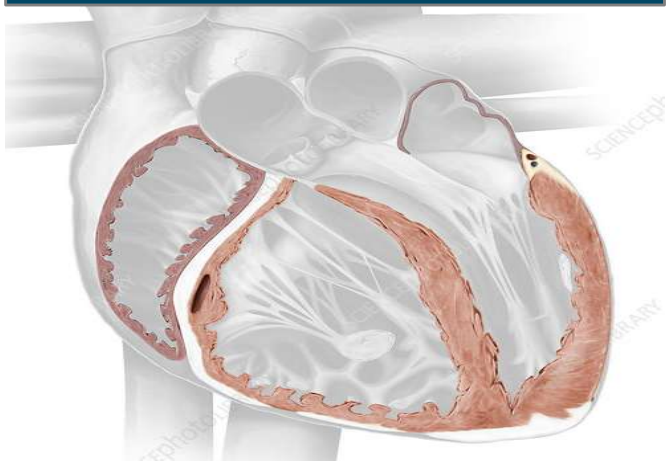
CSBC developed this toolkit of four resources to support BC health care providers with the safe and timely prescribing of medications for heart failure with reduced ejection fraction (HFrEF), including:

- Practice Update: Family physicians and nurse practitioners can now make Special Authority requests for sacubitril-valsartan combination (Entresto®) (November 2025)
- Clinical Resource: HFrEF GDMT Pathway (November 2025)
- Clinical Resource: Guidance for the Use of the HFrEF GDMT Pathway (November 2025)
- Educational handout: Medications for heart failure with reduced ejection fraction (EF) - English, French, Arabic, Farsi (Persian), Punjabi, Simplified Chinese, Spanish, Tagalog (Filipino), Traditional Chinese (November 2025)

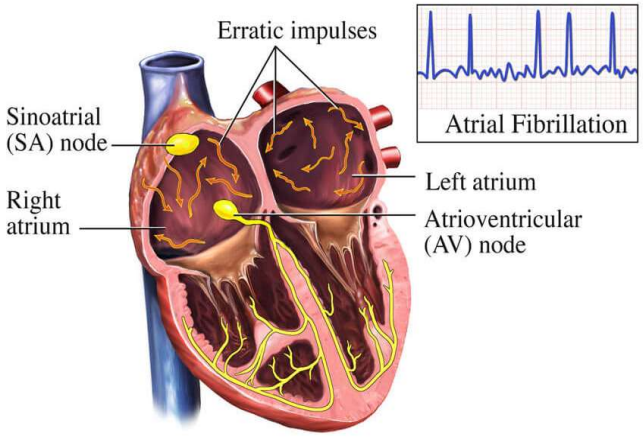
https://www.cardiacbc.ca/clinical-resources/heart-failure

Causes of heart failure

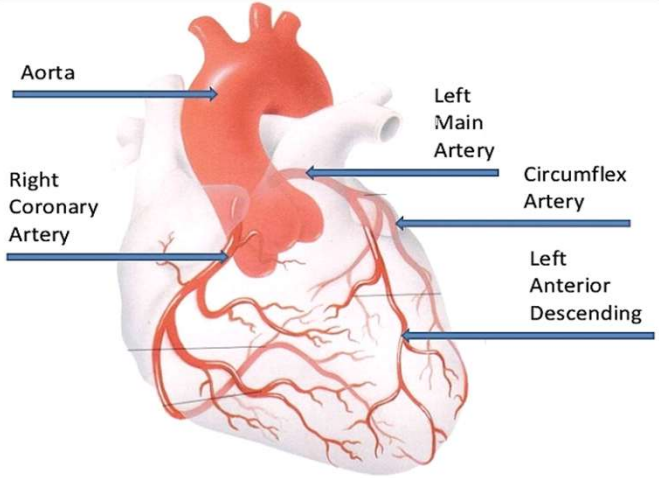
1. Muscle



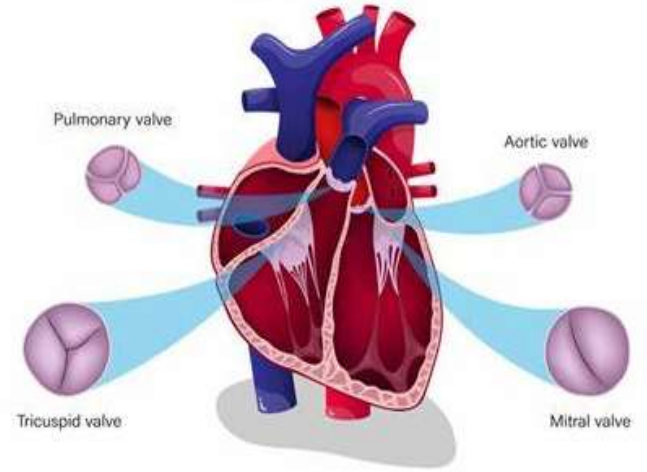
2. Electrical



3. Coronaries



4. Valves



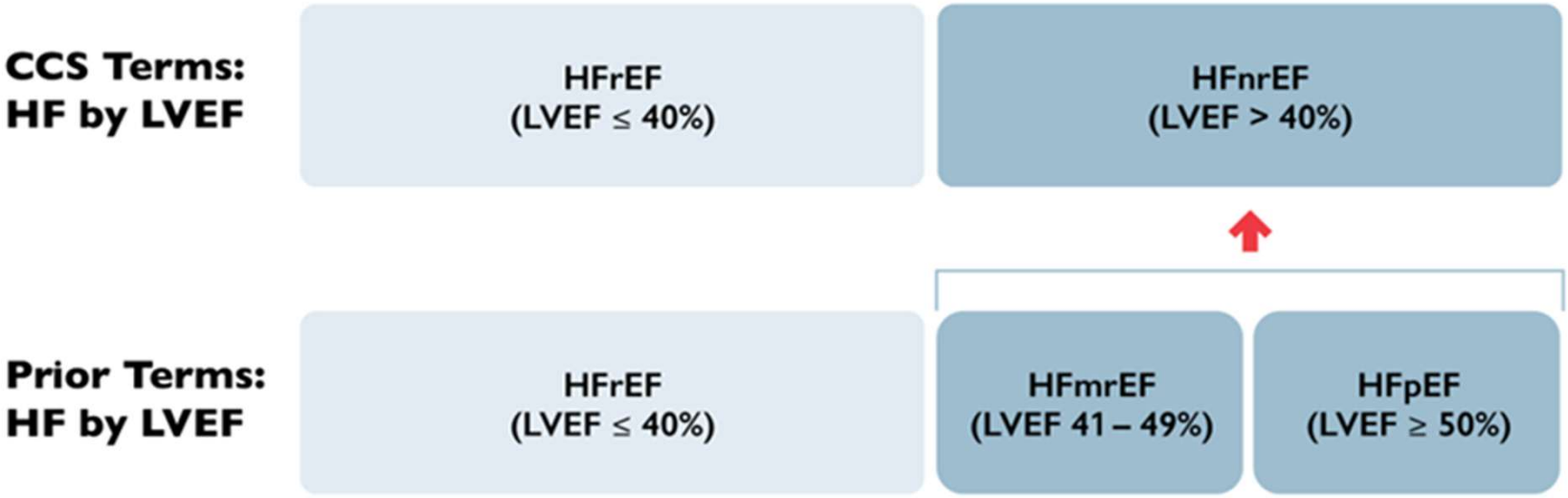
Many causes

Alcohol, Amyloid, Atrial fibrillation, Atrial flutter, Cancer treatment, Constriction, Diabetes, Drugs, Dyssynchrony, Familial, Genetic, Hypertension, Hypertrophic, Infiltrative, Ischemic, Metabolic, Myocarditis, Neuromuscular, Pacing, Peripartum, PVCs, Sarcoid, Sepsis, Takotsubo, Valves, Viral

What do the Canadian Cardiovascular Society and Prince have in common?

Canadian Cardiovascular Society

HFnrEF: the syndrome formerly known as HFmrEF and HFpEF



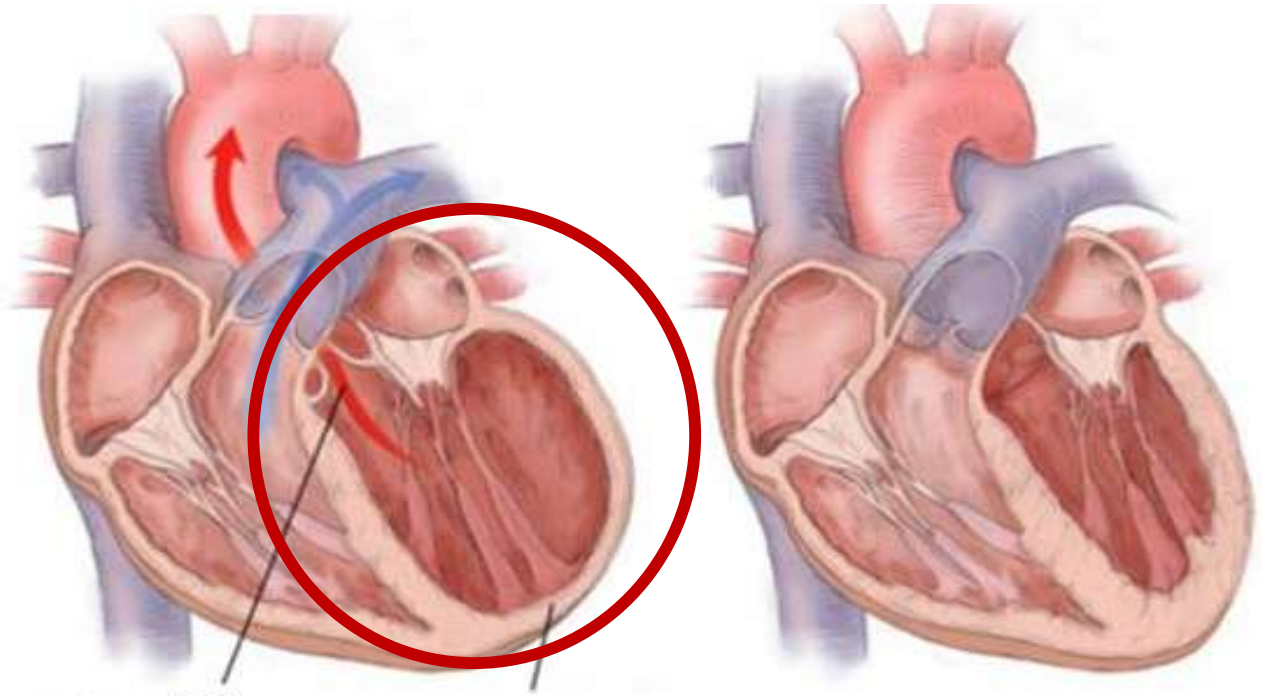
- Similar outcomes and treatment response >40% LVEF
- Unified, practical framework for consistent, evidence-based care

Most importantly, how do you say it?
HFnrEF: ‘HF none rEF’

CCS Terms: HF by LVEF	HFrEF (LVEF ≤ 40%)	HFnrEF (LVEF > 40%)	
Prior Terms: HF by LVEF	HFrEF (LVEF ≤ 40%)	HFmrEF (LVEF 41 – 49%)	HFpEF (LVEF ≥ 50%)

Reduced and non-reduced ejection fraction

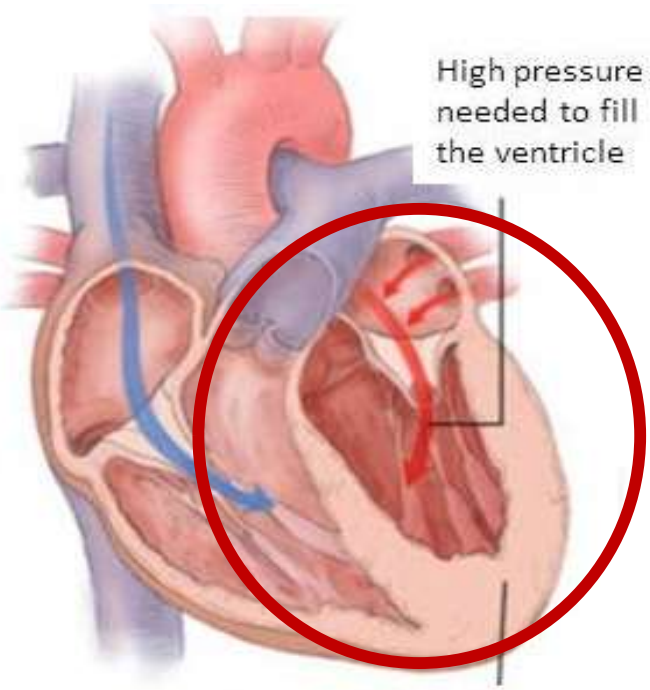
Reduced ejection fraction (HFrEF)
LVEF ≤ 40%



- Enlarged left ventricle
- Reduced pumping ability

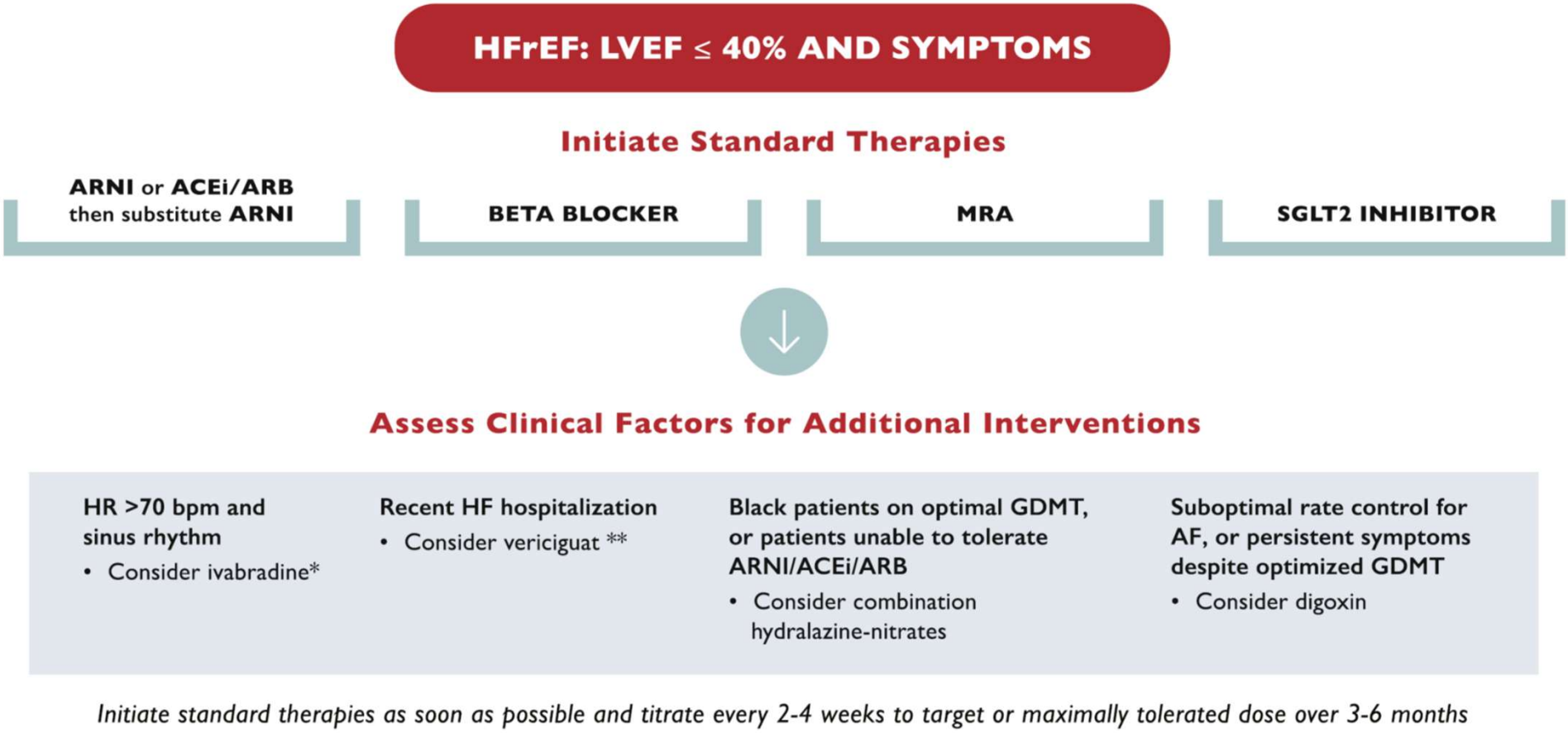
- Thinned walls
- Weakened muscle

Non-reduced ejection fraction (HFnrEF)
LVEF > 40%



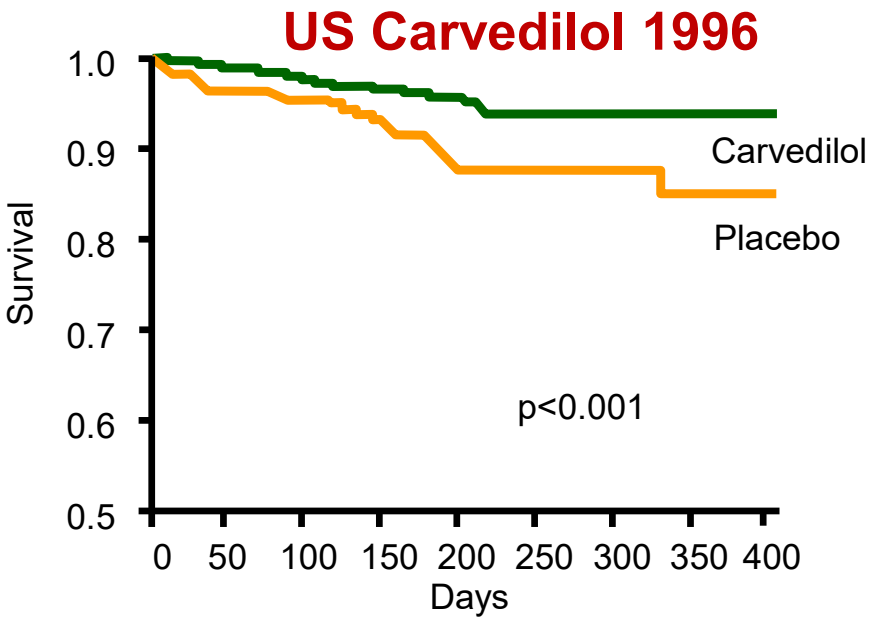
- Normal or small left ventricle size
- Thickened walls
- Stiff muscle
- Normal pumping capacity

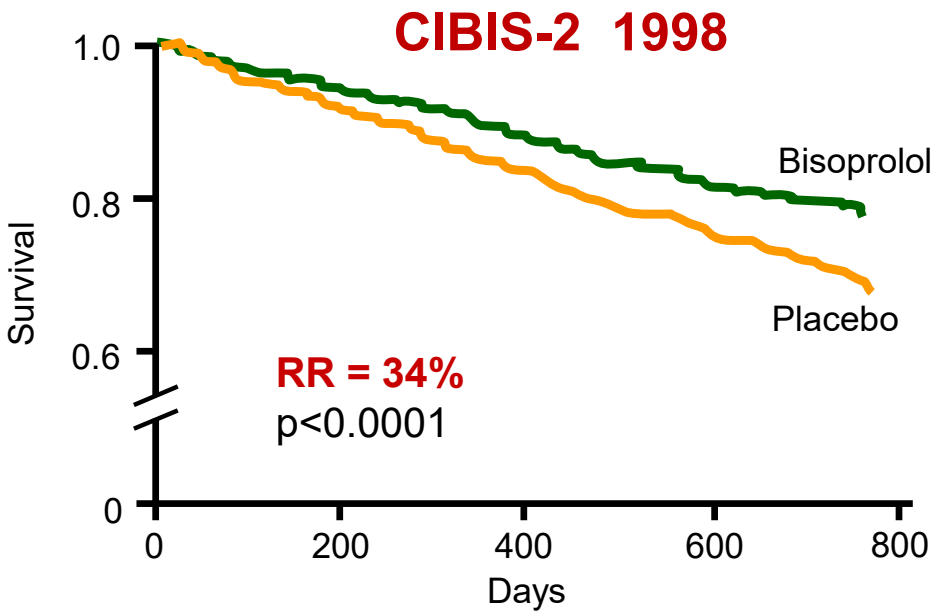
HFrEF: Quadruple therapy is standard of care

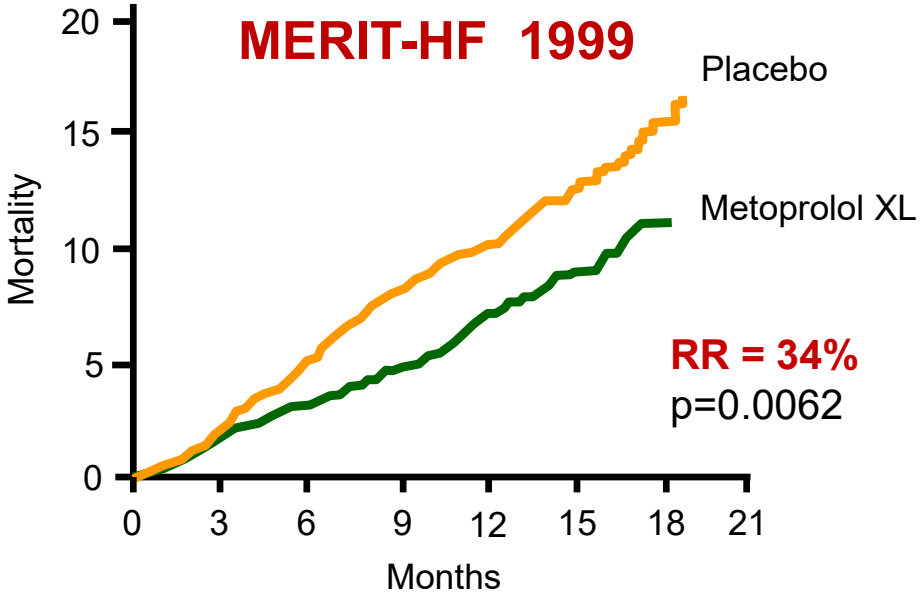


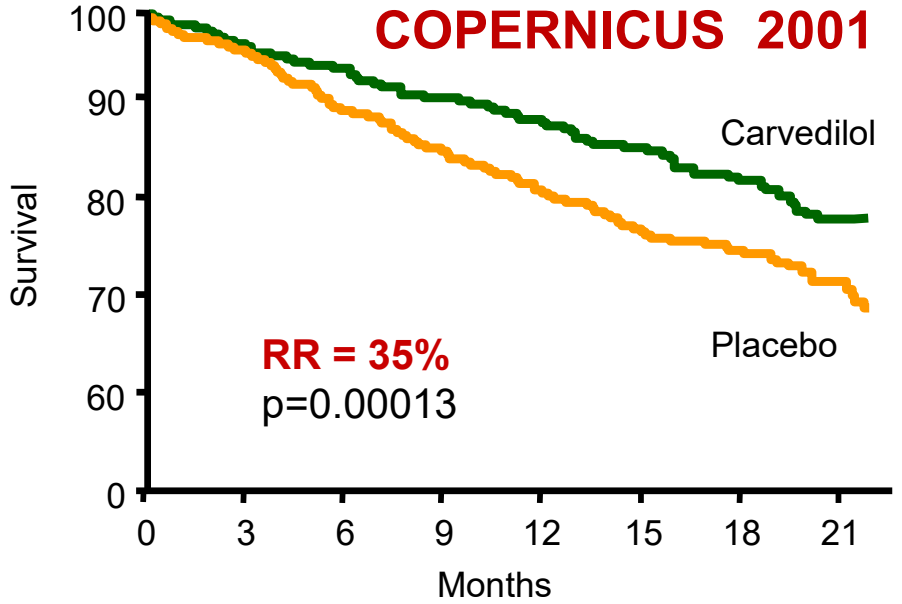
McDonald M, et al. Can J Cardiol. 2021;37:531-546

Beta-blockers reduce mortality by 35% in HFrEF

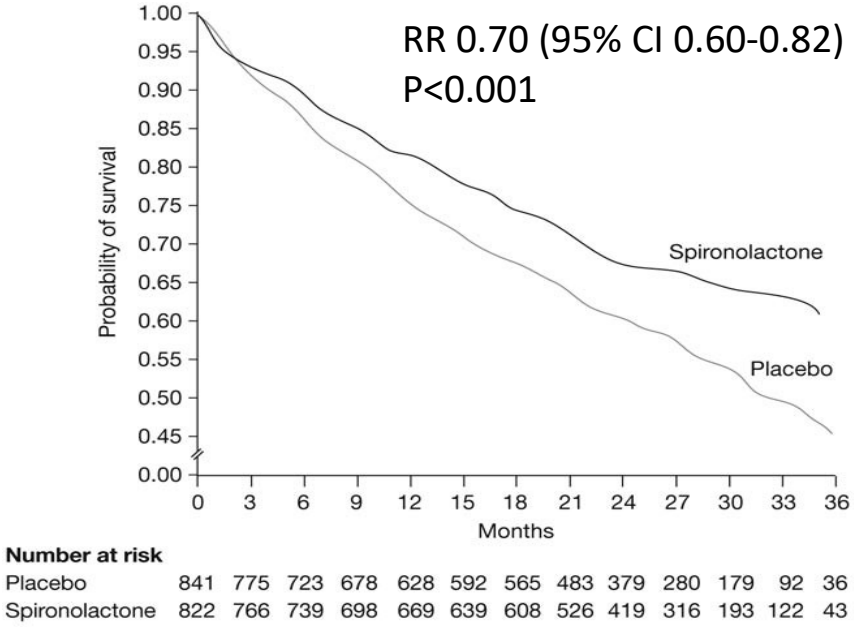








Aldosterone / mineralocorticoid receptor antagonists (MRA) in HFrEF



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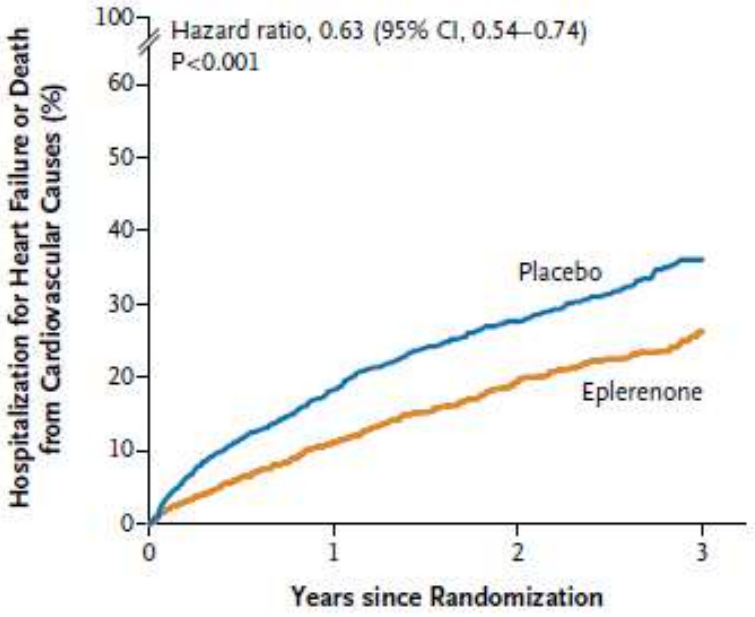


RALES trial (spironolactone)

- 30% reduction all-cause mortality

- LVEF ≤ 35%
- NYHA IV within 6 months
- n=1663

EMPHASIS-HF trial (eplerenone)

- 37% reduction CV death or HF hospitalization

- LVEF ≤ 35%
- NYHA II
- n=2737

ACEI were an excellent treatment in 1987 ...

The New England
Journal of Medicine

Volume 316 JUNE 4, 1987 Number 23

EFFECTS OF ENALAPRIL ON MORTALITY IN SEVERE CONGESTIVE HEART FAILURE

Results of the Cooperative North Scandinavian Enalapril Survival Study (CONSENSUS)

THE CONSENSUS TRIAL STUDY GROUP*

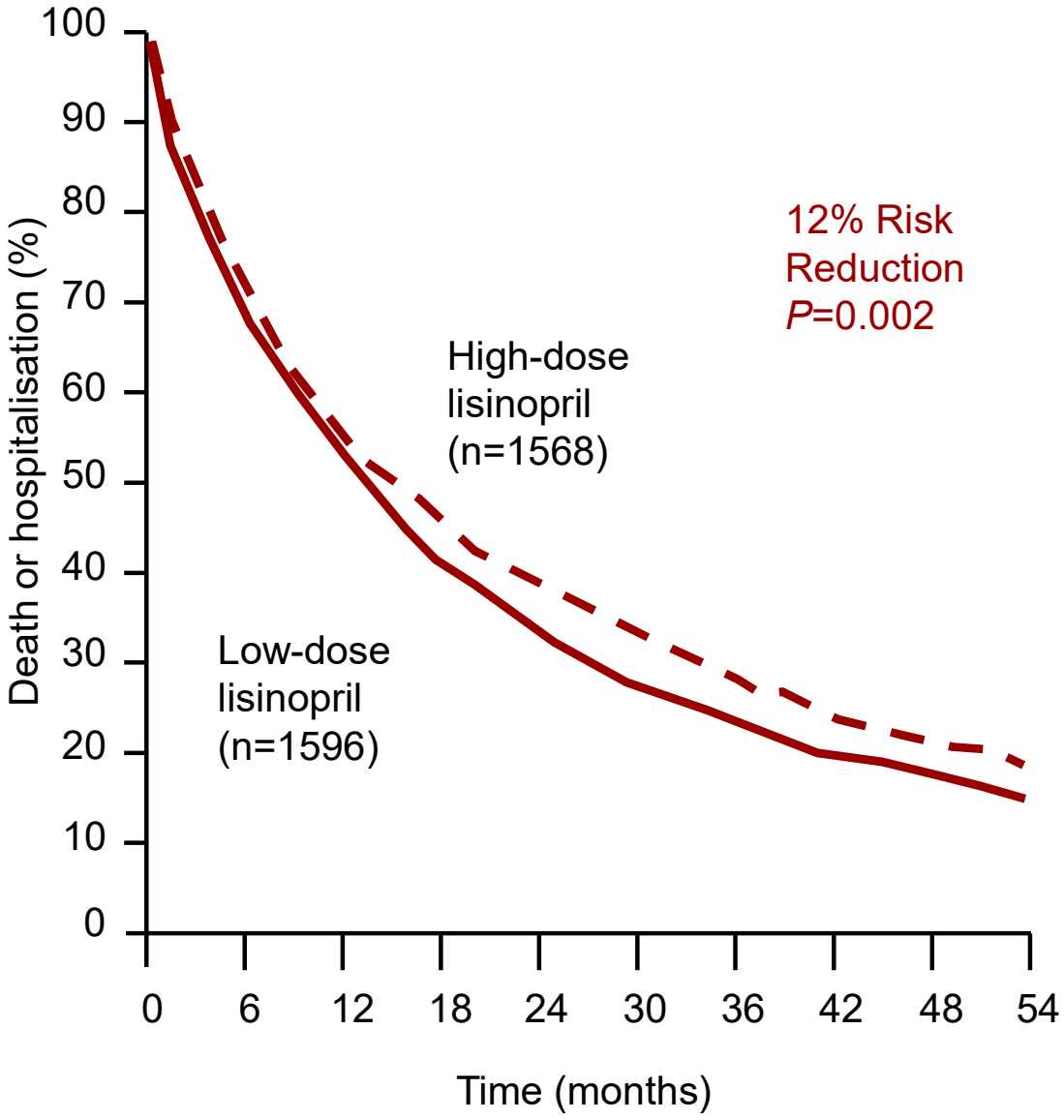
Limited benefit to high vs low dose ACEI

N= 3164	HF LVEF ≤30% NYHA II-IV

Low ACEI	High ACEI
Lisinopril 2.5-5.0 mg	Lisinopril 32.5-35.0 mg

1° endpoint all cause mortality

f/u 46 median months

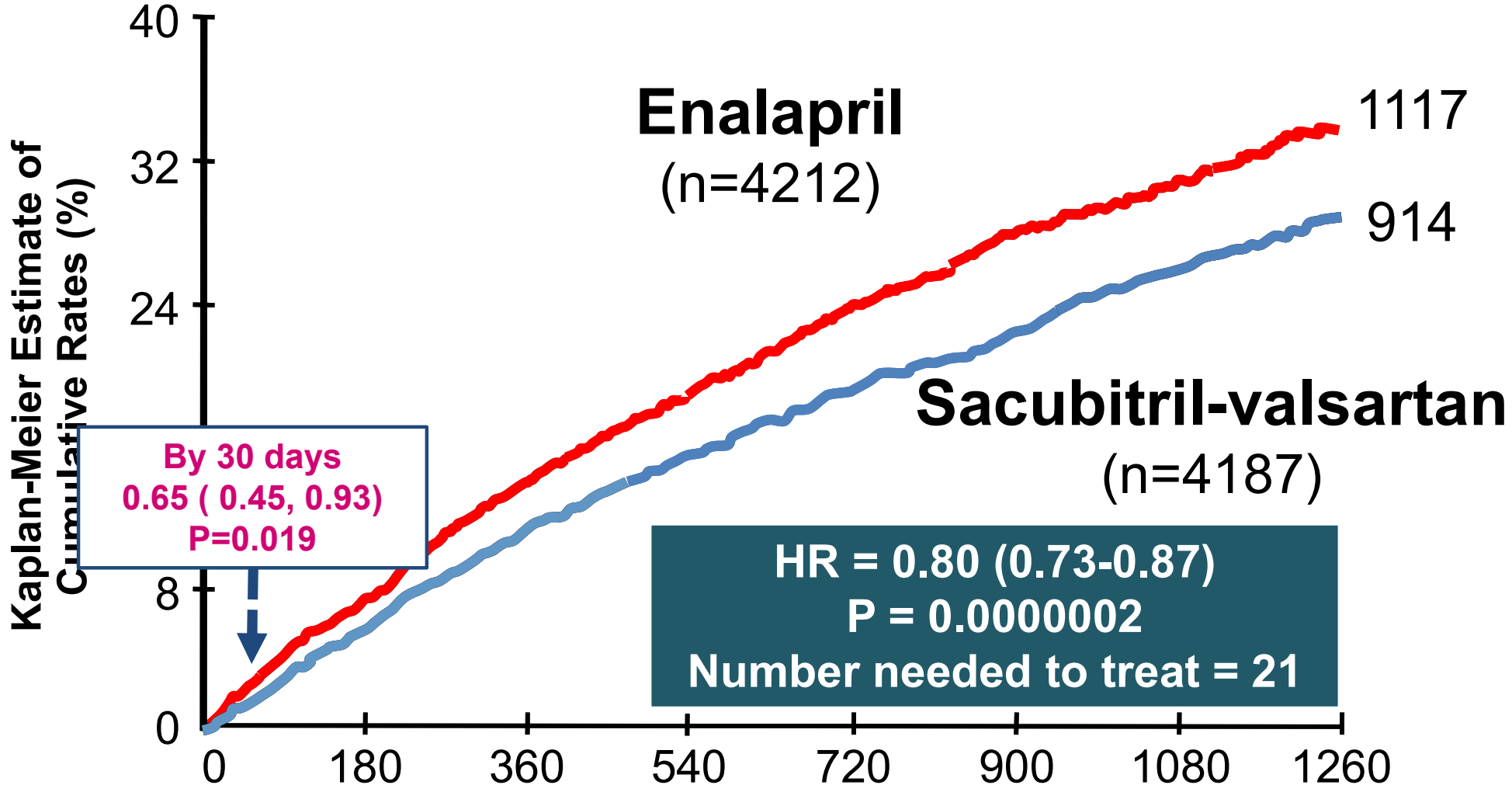


Packer M. Circulation 1999; 100(23):2312-2318

ARNI (angiotensin receptor-neprilysin inhibitor) i.e. sacubitril-valsartan

	Rec	Quality
We recommend that an ARNI be used in place of an ACEI or ARB, in patients with HFrEF, who remain symptomatic despite treatment with appropriate doses of GDMT to decrease CV death, HF hospitalizations, and symptoms	**Strong**	High
We recommend that patients admitted to hospital for acute decompensated HF with HFrEF should be switched to an ARNI, from an ACEI or ARB, when stabilized and before hospital discharge	Strong	Moderate
We suggest that patients admitted to hospital with a new diagnosis of HFrEF should be treated with ARNI as first-line therapy, as an alternative to either an ACEI or ARB	Weak	Moderate

20% reduction in CV death or HF hospitalization compared to ACEI



Patients at Risk

Sacubitril-val	4187	3922	3663	3018	2257	1544	896	249
Enalapril	4212	3883	3579	2922	2123	1488	853	236

Pharmacare Update - ARNI

Engagement

- CSBC engaged with Pharmacare Drug Review Committee for 18 months

Briefing Note Submission

Requested removal of Special Authority restrictions:

- Specialist Criteria: submission by Cardiologists and Internists only
- 4 weeks trial of inferior ACE-i or ARB & beta blocker prior to initiation of sacubitril/valsartan

Outcome

- Pharmacare has removed the specialist criteria

Cardiac Services BC
Provincial Health Services Authority

Practice Update

Topic	All BC prescribers can now make Special Authority requests for sacubitril-valsartan combination (Entresto®)
Date	November 4, 2025

Key Recommendations

- All BC healthcare providers who prescribe medications for patients with heart failure with reduced ejection fraction (HFrEF) can now make Special Authority requests for sacubitril-valsartan combination (Entresto®). Previously, only specialists could make Special Authority requests for sacubitril-valsartan.
- Canadian Cardiovascular Society Guidelines (2021) recommend treating patients with HFrEF with four standard therapies known as "guideline-directed medical therapy (GDMT)": an ARNI (or ACEI/ARB), a beta-blocker, an MRA, and an SGLT2 inhibitor.
- Family physicians and nurse practitioners (NPs) are encouraged to submit sacubitril-valsartan Special Authority requests for their patients where appropriate.
- For eligibility criteria and current forms, visit: gov.bc.ca/pharmacarespecialauthority

https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/pharmacare/programs/limited-coverage-drug-program/limited-coverage-drugs-sacubitril-valsartan

Pharmacare Update - ARNI

Special Authority criteria

For the treatment of heart failure (HF) with reduced ejection fraction in patients with New York Heart Association (NYHA) class II or III HF, **if** ALL the following clinical criteria are met:

- Reduced left ventricular ejection fraction (LVEF) ≤ 40%

  AND

- Patient has NYHA class II to III symptoms despite at least four weeks of treatment at the optimum stable dose of:
  - an angiotensin-converting enzyme inhibitor (ACEI) or an angiotensin II receptor antagonist (ARB), and
  - a beta blocker

  AND

- Patient will be using sacubitril-valsartan in combination with other recommended therapies, including an aldosterone antagonist (if tolerable)

  AND

- Initiation and up-titration should be conducted by a prescriber experienced with the treatment of heart failure

Practitioner exemptions

- None

Special notes

- Sacubitril-valsartan should be administered in place of an ACEI or an ARB

https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/pharmacare/programs/limited-coverage-drug-program/limited-coverage-drugs-sacubitril-valsartan

SGLT2i in HFrEF: DAPA-HF trial

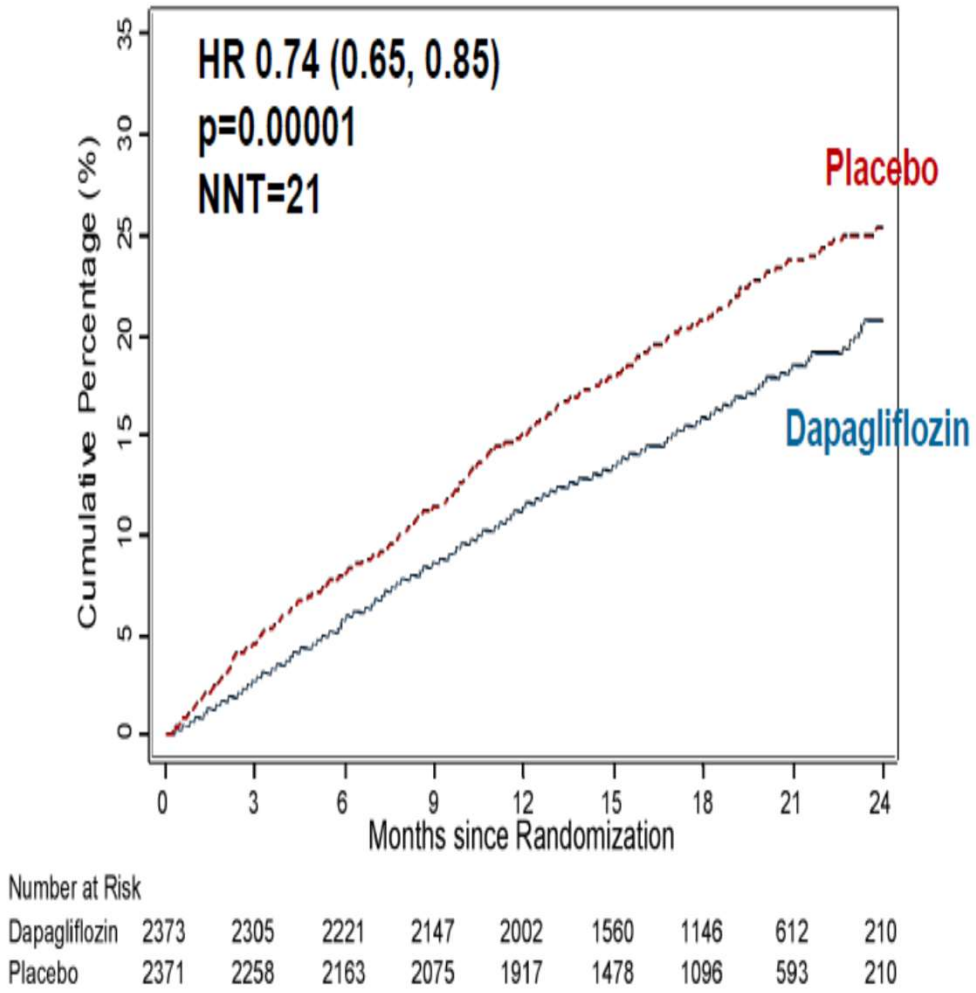
- **Inclusion criteria**
  - HFrEF LVEF ≤40%
  - NTproBNP ≥600 pg/ml
    - if HFH 12m ≥400 pg/mL
    - if AF/flutter ≥900 pg/mL

- **Exclusion criteria**
  - eGFR <30 ml/min/1.73 m2
  - Symptomatic hypotension or SBP <95 mmHg
  - type 1 diabetes mellitus

Treatment (%)	Dapagliflozin n=2373	Placebo n=2371
ACEI/ARB/ARNI	**94**	**93**
ACEI	56	56
ARB	28	27
ARNI	11	11
Beta-blocker	**96**	**96**
MRA	**71**	**71**
ICD	26	26
CRT	8	7
Diuretics	93	94

McMurray JJV, et al. *Eur J Heart Fail*. 2019;21:665-675

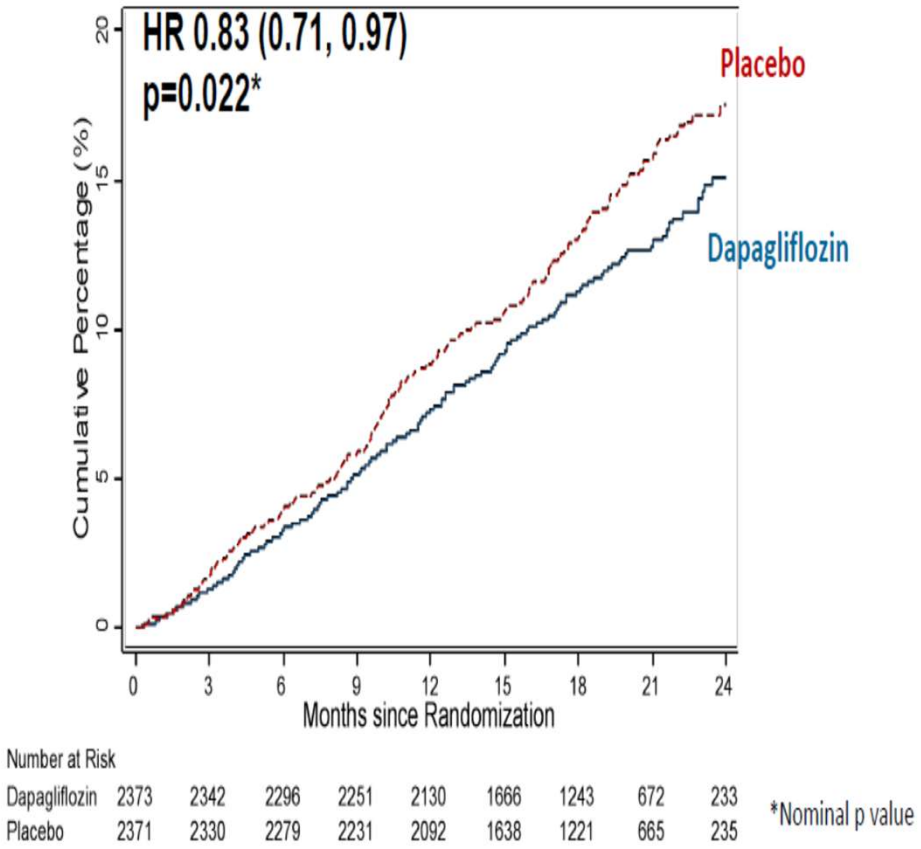
Dapagliflozin reduces CV death, HF hospitalization, urgent HF visit

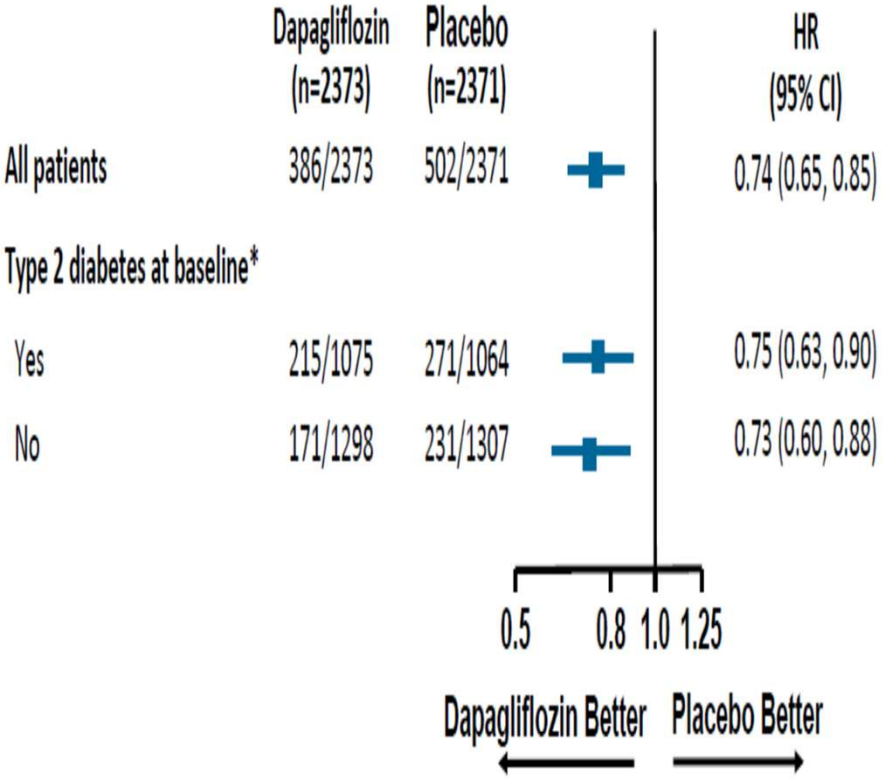


- Event rate 16.3% vs 21.2%
- Absolute risk reduction = 4.9%
- Number needed to treat = 21

McMurray JJV, et al. *N Engl J Med*. 2019;381:1995-2008

Dapagliflozin reduces all-cause death





McMurray JJV, et al. *N Engl J Med*. 2019;381:1995-2008

GDMT Initiation and Titration Pathway

For Patients with HFrEF (LVEF ≤ 40%)

STEP 1: Select initiation strategy:

1. Simultaneous initiation of all 4 classes
   OR
2. Start 2 classes at first visit and 1 class per subsequent visit until on all 4 classes
   OR
3. If on partial GDMT, initiate the rest of the 4 classes

- DO aim to reach target or maximally tolerated doses within 5 visits, every 2 weeks (by 3 months after diagnosis of HFrEF)
- DO titrate 1-2 medication(s) per visit and double the dose when up-titrating
- DO assess BP (sitting & standing), HR and change in symptoms and/or NYHA class every visit. Check NTproBNP if volume status uncertain
- DO check Na/K+/sCr/eGFR 1-2 weeks after initiating or titrating ACEi/ARB/ARNI or MRA (see page 2 for management guidance)
- DO seek specialist support if eGFR 20-30, K+ 5.0-5.5, SBP 90-95mmHg at initiation

- DON'T initiate a new medication if initiating parameters (STEP 2) are not met - reassess eligibility at next visit
- DON'T titrate ACEi/ARB/ARNI and MRA on same visit unless stable renal function and BP, and no hyperkalemia

STEP 2: Ensure initiating parameters are met

ACEi/ARB/ARNI

SBP >95mmHg, K+<5.0, eGFR>30

Beta Blocker

Patient euvolemic, SBP>95mmHg, HR>55

MRA

SBP >95mmHg, K+<5.0, eGFR ≥30

SGLT2i

No Type 1 diabetes or prior ketoacidosis, and eGFR>20

STEP 3: Titrate to target or maximally tolerated doses*

If treatment naïve, start ACEi	ACEi	Ramipril 1.25mg BID (25%)	Ramipril 2.5mg BID (50%)	Ramipril 5mg BID (100%)	STOP AFTER 4 WEEKS AND SWITCH TO ARNI
If intolerant to ACEi, apply for Special Authority and start ARB	ARB	Candesartan 4mg daily (12.5%)	Candesartan 8mg daily (25%)	Candesartan 16mg daily (50%)	Candesartan 32mg daily (100%)
If on ACEi/ARB and beta blocker for 4 weeks, apply for Special Authority and switch to ARNI**	ARNI	Sacubitril-valsartan 24/26mg BID (25%)	Sacubitril-valsartan 49/51mg BID (50%)	Sacubitril-valsartan 97/103mg BID (100%)	

**36 hour washout period from ACEi ↔ ARNI

Bisoprolol 1.25mg daily (12.5%)	Bisoprolol 2.5mg daily (25%)	Bisoprolol 5mg daily (50%)	Bisoprolol 10mg daily (100%)	
Spironolactone 25-50mg*** daily (100%)				***Consider increasing spironolactone to 50mg daily if continued signs & symptoms ***Consider eplerenone if intolerant to spironolactone - exceptional approval required for BC PharmaCare coverage
Dapagliflozin 10mg daily (100%)				*Ensure patient is registered with BC PharmaCare *Dosing recommendations are based on the best available evidence and clinical expertise *For further agents & target doses, refer to CCS/CHFS HF Guidelines Update (2021)

STEP 4: Post-titration follow-up:

- Keep medications at target or maximally tolerated doses despite LVEF improvement
- Organize echocardiogram to be completed after 3 months of optimal GDMT to reassess LVEF and assess eligibility for ICD/CRT
- Schedule follow-up appointment to review echocardiogram results
- Consider individualized therapies (see page 2)

https://www.cardiacbc.ca/Documents/HFrEF%20GDMT%20Pathway_Nov%204%202025.pdf

Common concern 1. Worsening renal function

History

- 71 years
- 6 months post anterior MI with PCI
- LVEF 30%, mild MR
- ICD 6 weeks ago

Exam and labs

- Sinus rhythm 80
- BP 96/70
- Mild edema
- JVP 6 cm
- Sat 93%
- Crackles < 1/3
- Na 130, K+ 4.5
- Creatinine rise 155 (130)
- eGFR 45

Medications

- Carvedilol 12.5 bid
- Spironolactone 12.5 od
- Enalapril 5 bid
- Furosemide 40 od
- ASA 81 od
- Clopidogrel 75 od
- Atorvastatin 80 od
- Ezetimibe 10

Question 1. What do you do?

- Wet
- Soft BP 96/70
- SR 80
- Worse eGFR 45
- K 4.5
- Low-mid dose triple therapy

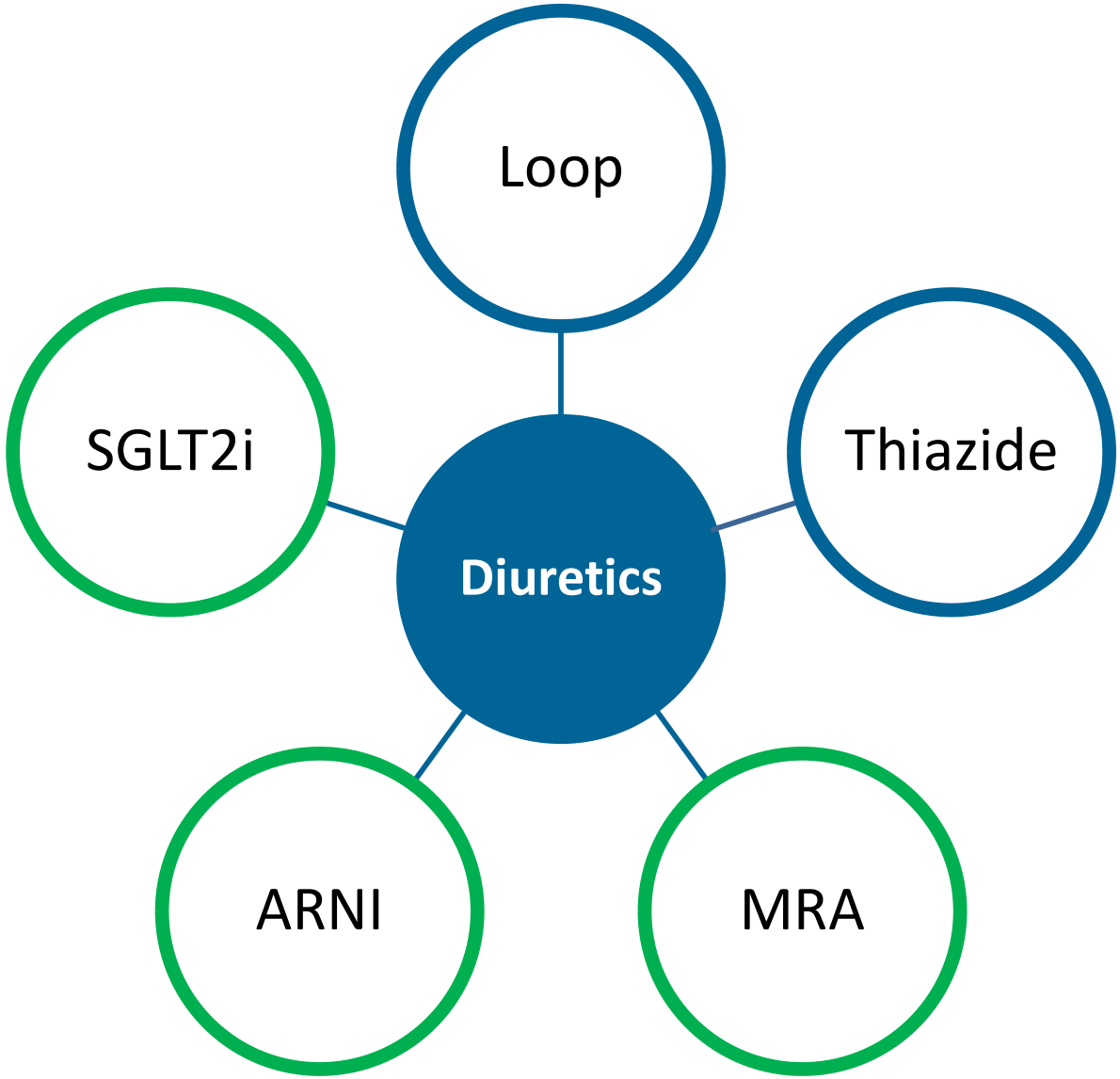
- Decrease
  - Furosemide
  - MRA, ACEI or beta-blocker
- Increase
  - Furosemide
  - MRA, ACEI or beta-blocker
- Add
  - sacubitril-valsartan
  - SGLT2I

Question 1. What do you do?

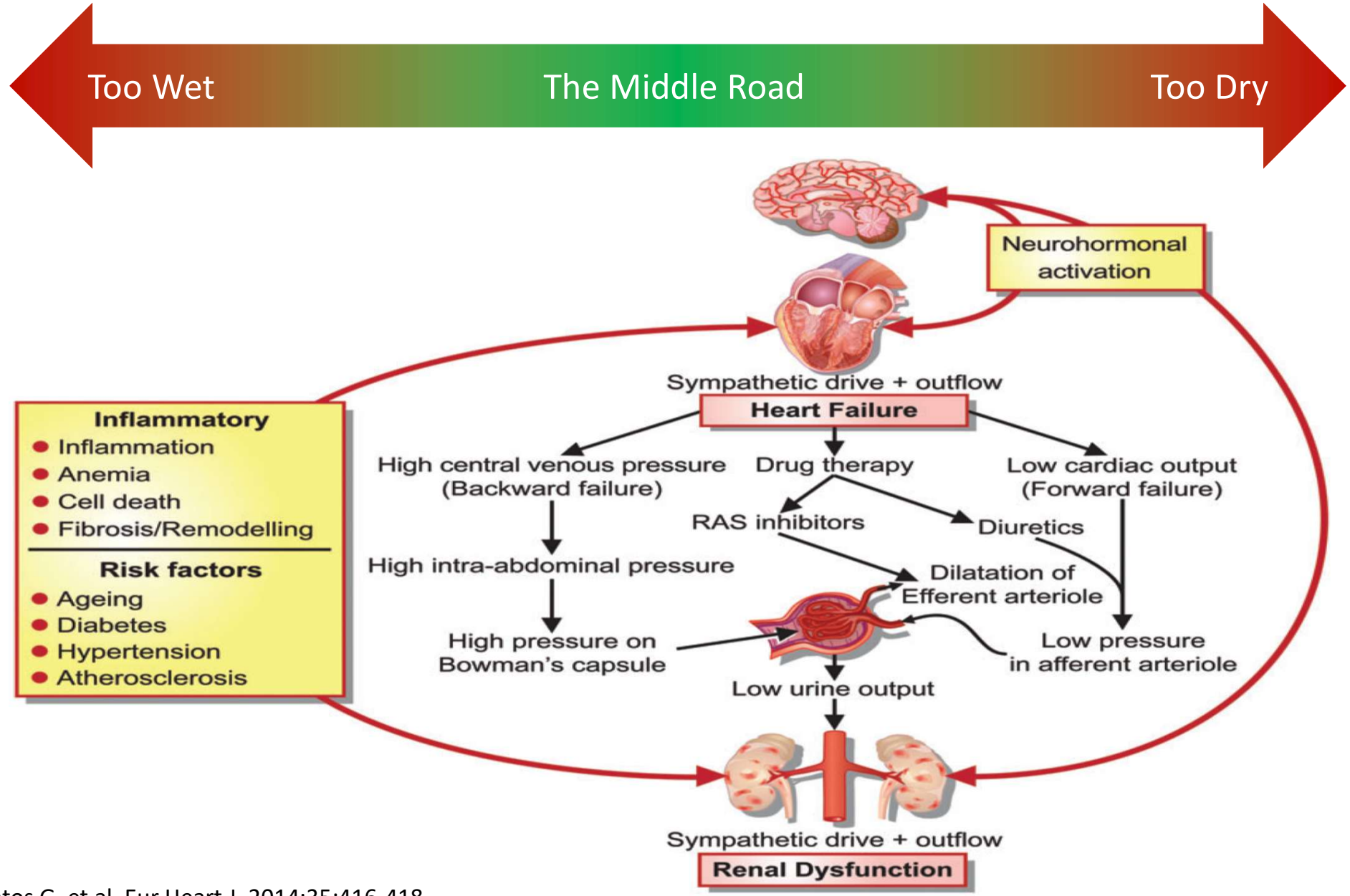
- Wet
- Soft BP 96/70
- SR 80
- Worse eGFR 45
- K 4.5
- Low-mid dose triple therapy

- Decrease
  - Furosemide
  - MRA, ACEI or beta-blocker
- **Increase**
  - Furosemide
  - **MRA**, ACEI or beta-blocker
- **Add**
  - sacubitril-valsartan
  - **SGLT2I**

Diuretics in HF: 3 of quadruple therapy have diuretic activity

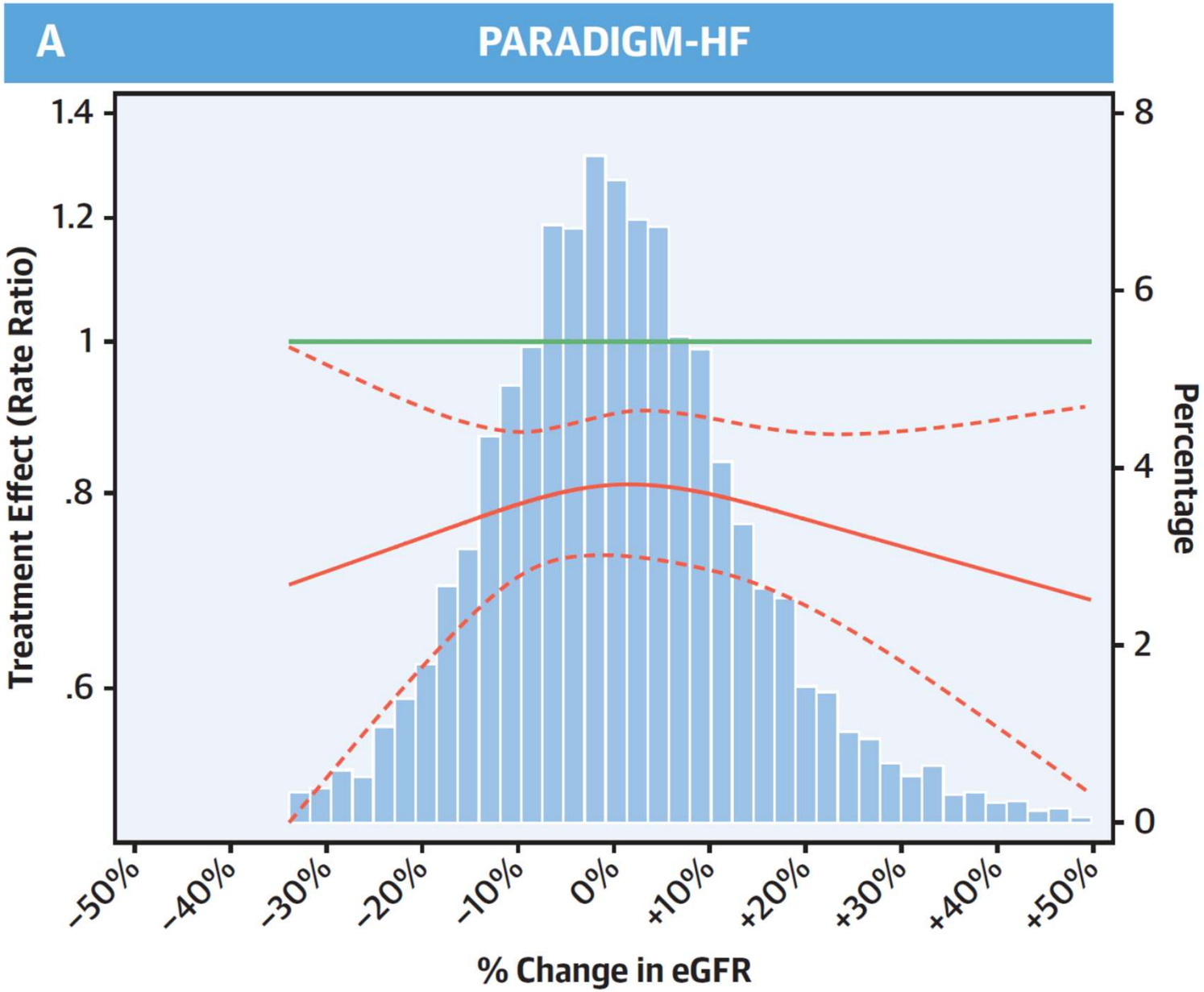


Cardiorenal syndrome



Filippatos G, et al. Eur Heart J. 2014;35:416-418

Early renal function change with GDMT: expected … and NOT a problem

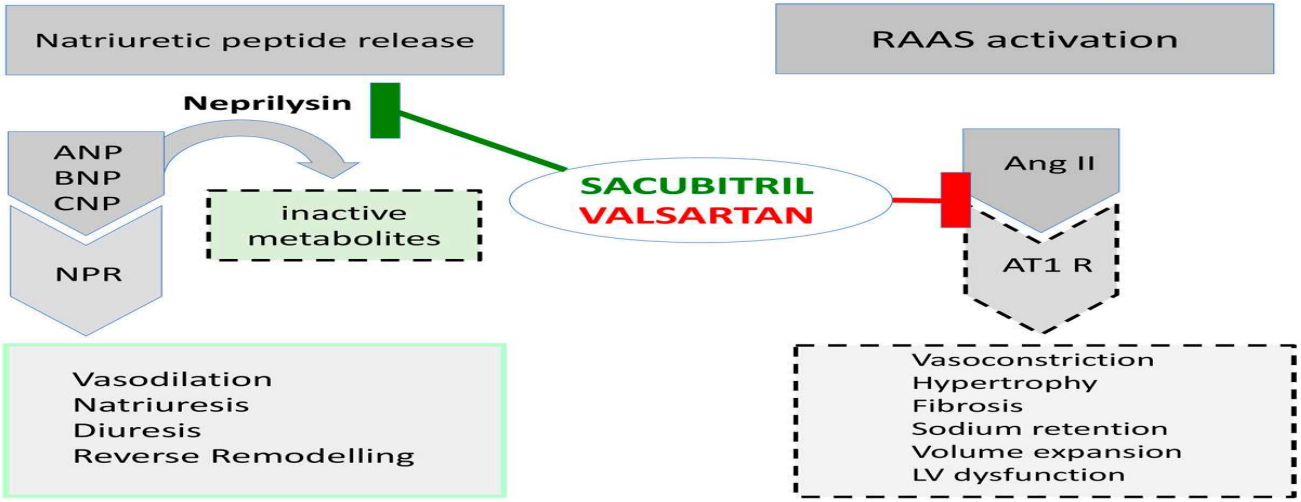


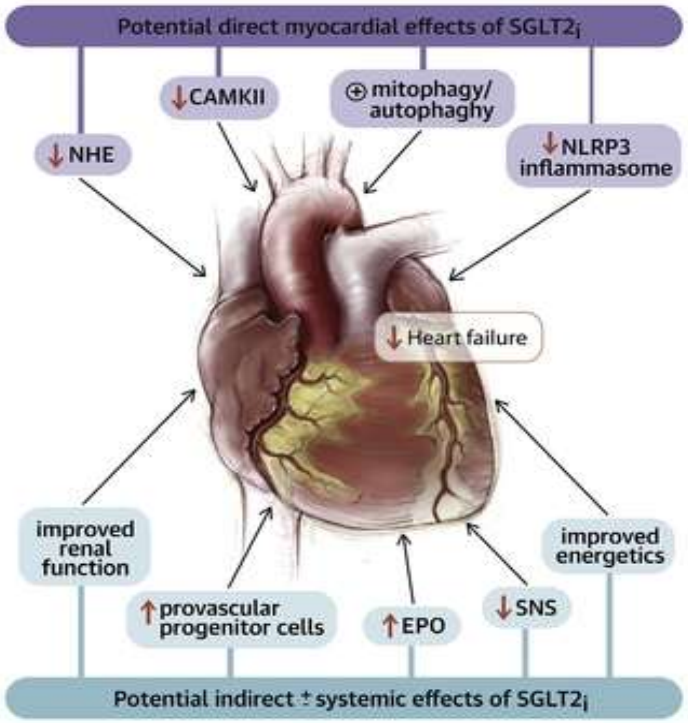
Chatur S, et al. J Am Coll Cardiol. 2023;81:1443-1455

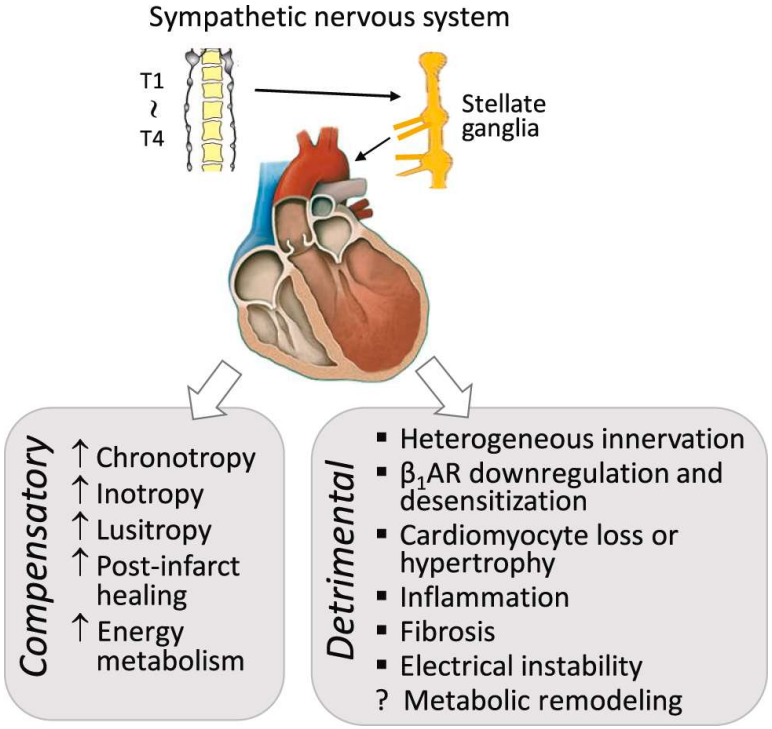
What is the effect of adding one therapy to another in HFrEF?

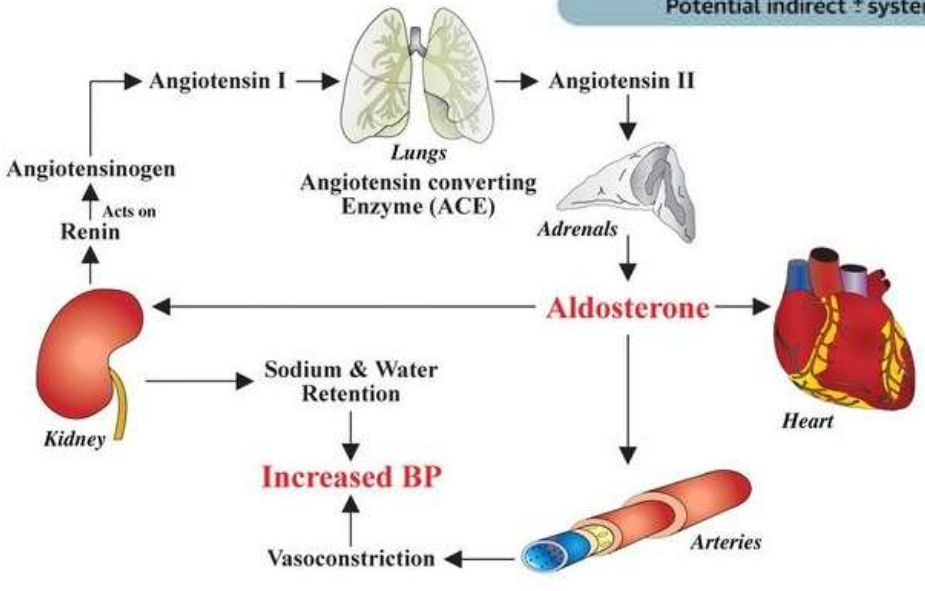
- Subtractive 1 + 1 = 0.5
- Redundant 1 + 1 = 1.0
- Partially Additive 1 + 1 = 1.5
- Fully Additive 1 + 1 = 2.0
- Synergistic 1 + 1 = 2.5

Additive: Multiple, largely non-overlapping therapeutic targets

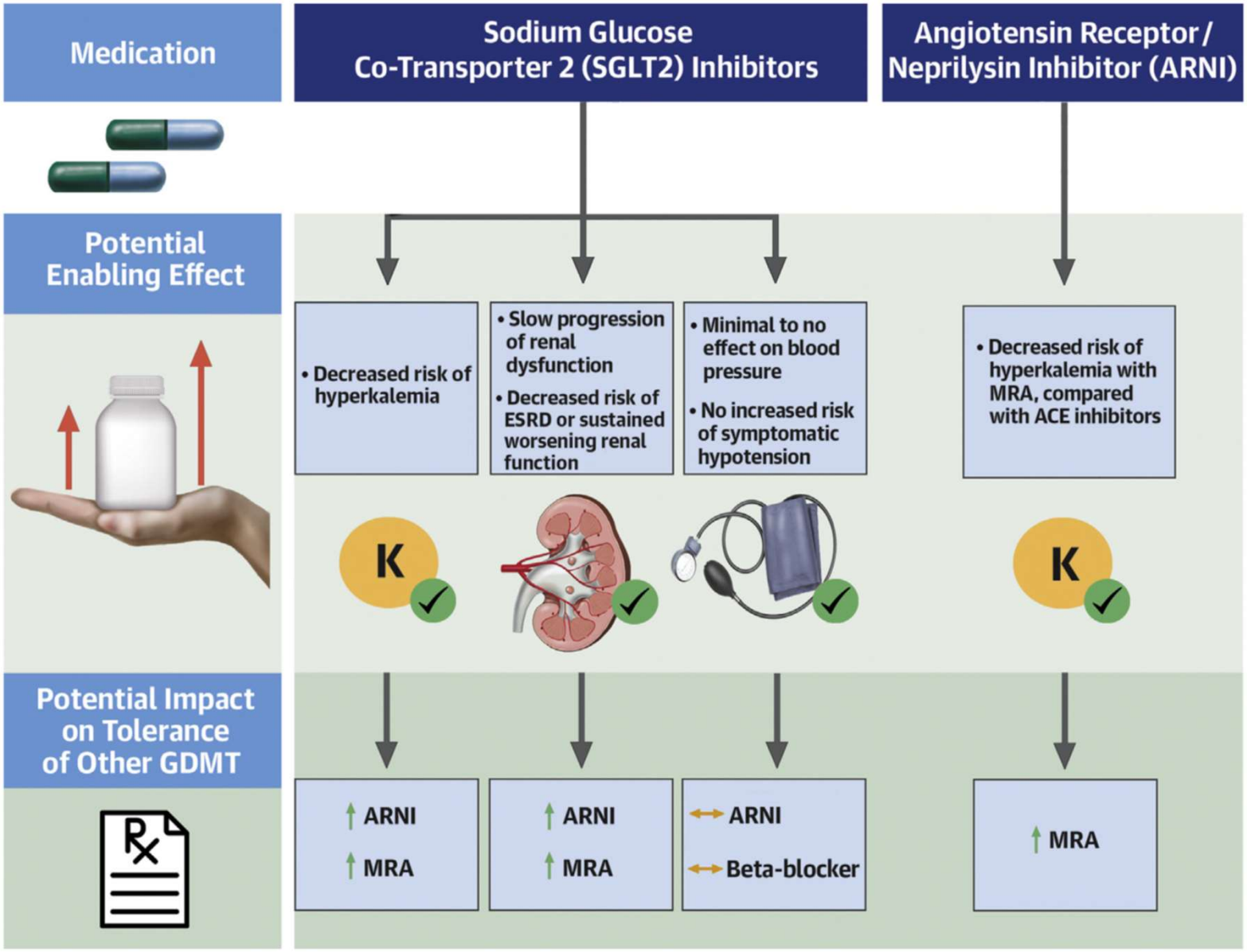






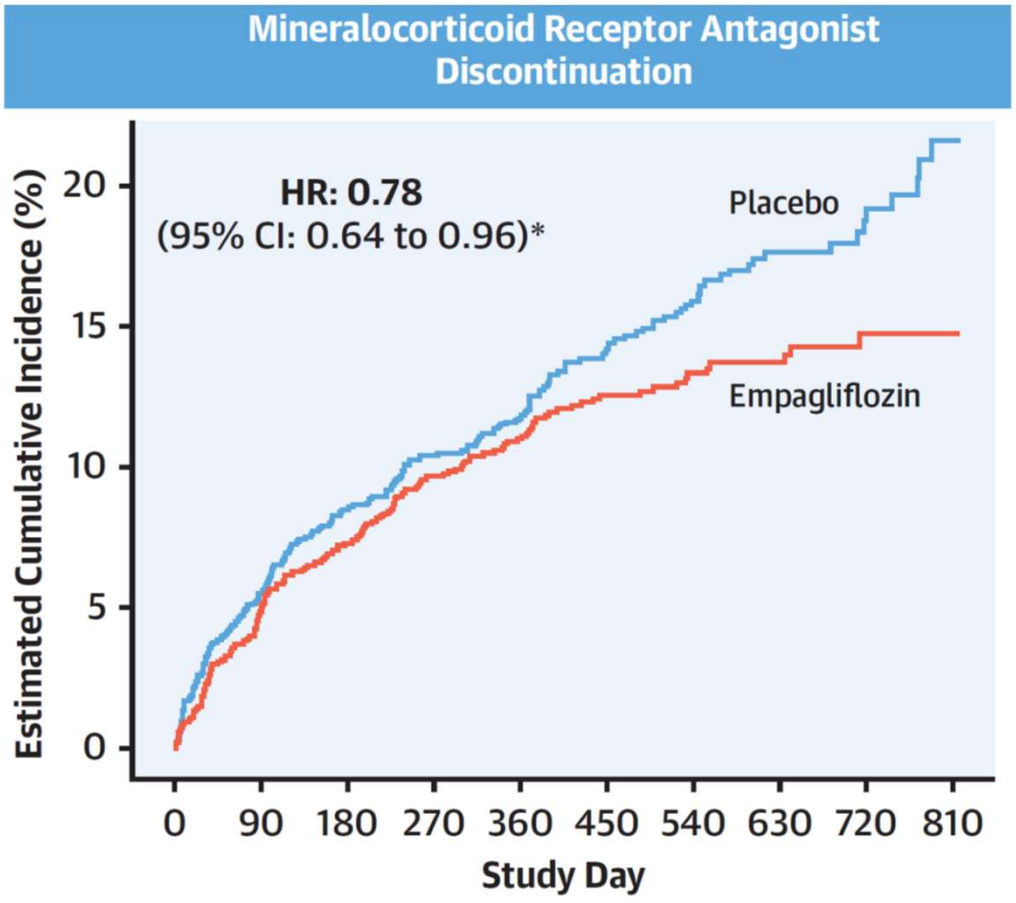


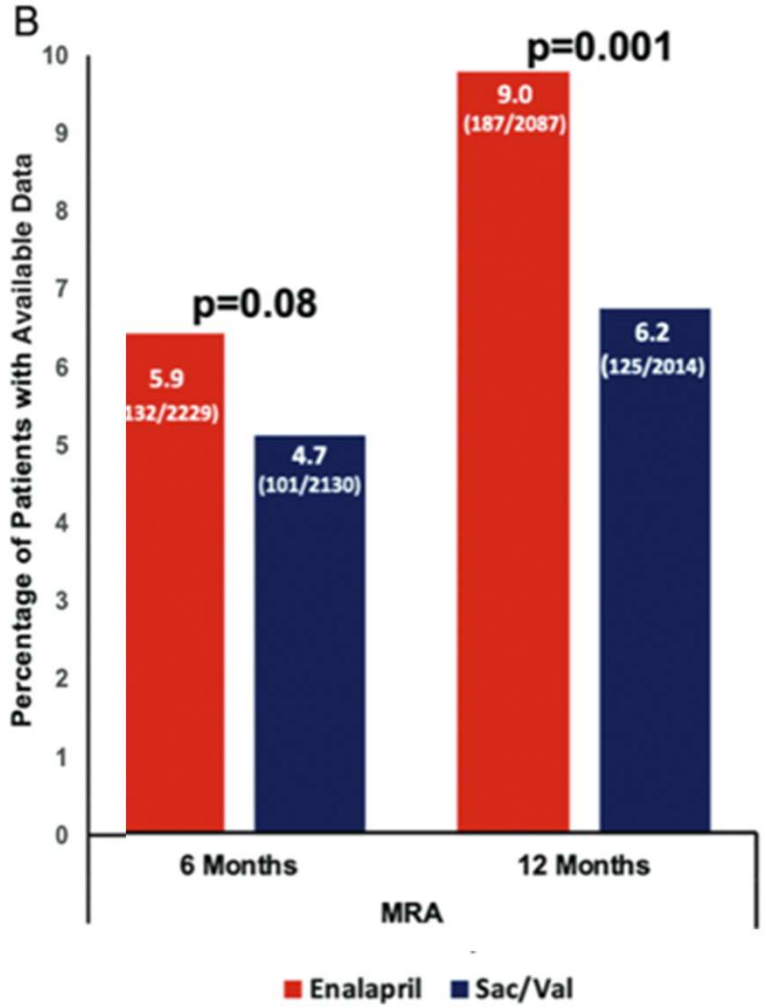
Synergistic: Complementarity between therapies



Greene SJ, Khan MS. J Am Coll Cardiol. 2021;77:1408-1411

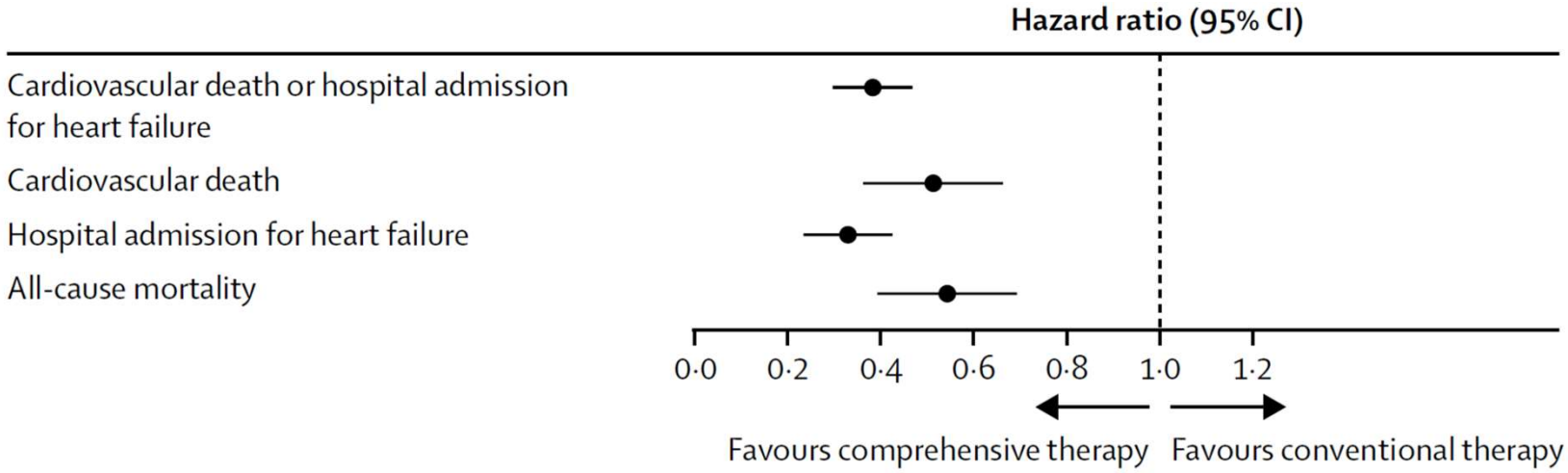
Initiating SGLT2i or switching to ARNI reduces MRA discontinuation

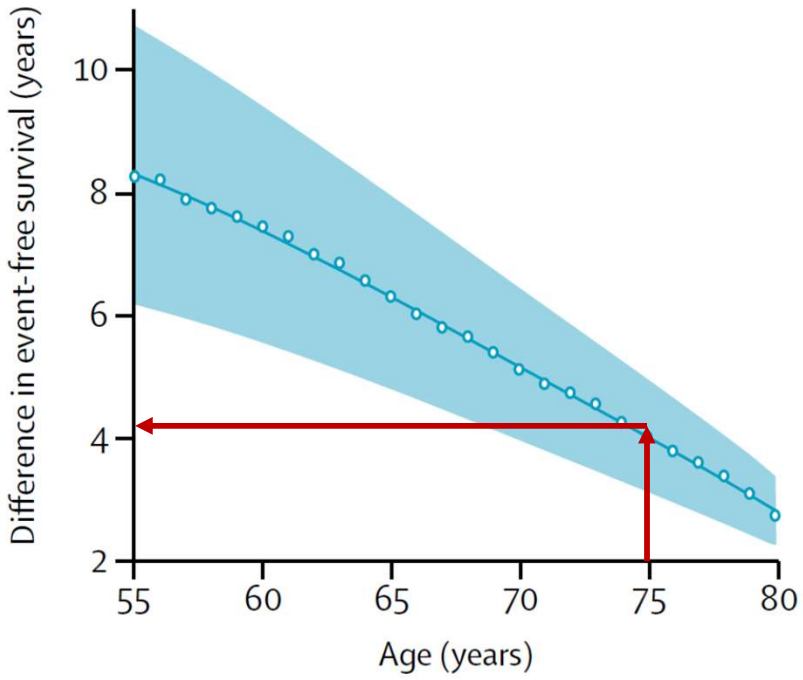


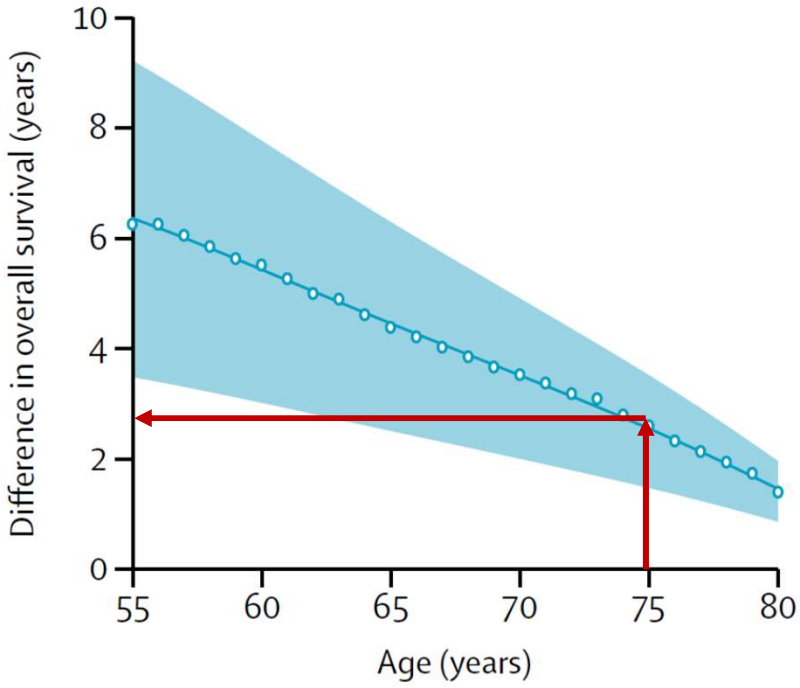


Ferreira JP, et al. J Am Coll Cardiol. 2021;77:1397-1407; Bhatt AS, et al. Eur J Heart Fail. 2021;23:1518-1524

Lifetime benefits of quadruple versus dual therapy







Vaduganathan M, et al. Lancet. 2020.

Key takeaways so far

- Number of GDMT is more important than doses
- Multiple GDMT initiation/titration during a single visit is usually safe and well tolerated
- Worsening eGFR is common after initiation of GDMT, and is usually transient and benign
- Quadruple therapy is complementary and synergistic

Common concern 2. Hyperkalemia

History

- 72 years
- HFnrEF
- LVEF 51%
- T2DM 10 years
- HTN
- NSTEMI
- CKD stage 3

Exam and labs

- HR 70
- BP 125/60
- No edema
- JVP 1 cm
- BMI 33.1 kg/m2
- Euvolemia

- Na 138, K+ 4.8
- eGFR 34
- HbA1c 8.5%

Medications

- Perindopril 8 od
- Bisoprolol 5 od

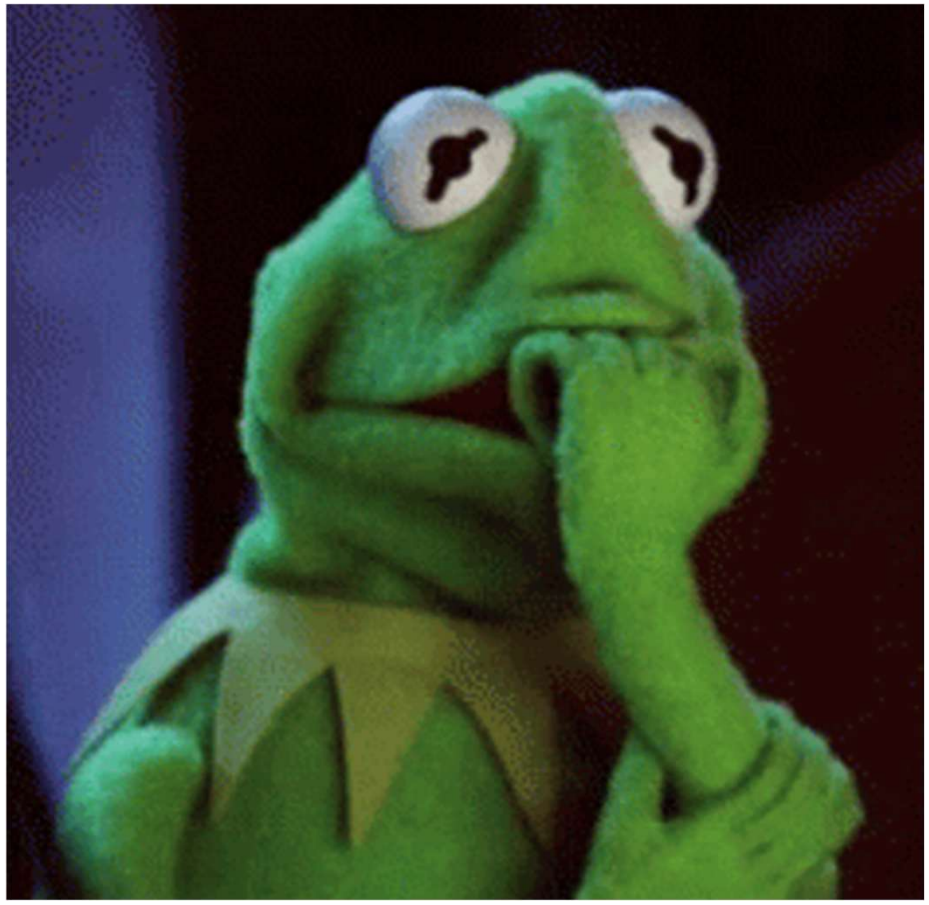
- Furosemide 40 od

- Metformin 500 bid
- Gliclazide MR 30 od

- ASA 75 od
- Clop 75 od
- Atorvastatin 80 od

You start an MRA and check labs …

- eGFR 30 ml/min/m2
- K+ 5.8



What do you do?

- HFnrEF
- Euvolemia
- eGFR 30
- K 5.8
- ACEI
- Started MRA

- Send to the ED
- Recheck K+
- Reduce MRA dose
- Review diet
- Review medications
- Consider an SGLT2I
- Start potassium binder

What do you do?

- HFnrEF
- Euvolemia
- eGFR 30
- K 5.8
- ACEI
- Started MRA

- Send to the ED
- **Recheck K+**
- **Reduce MRA dose**
- **Review diet**
- **Review medications**
- **Consider an SGLT2I**
- Start potassium binder

Hyperkalemia management

Severity K^+ mmol/L	Management	Monitoring
Mild 5.0 – 5.5 mmol/L	RAAS continue Potassium restriction Drugs: K^+ sparing diuretic, NSAID, K^+ supplement Hypovolemia	Routine if stable Repeat within 72 hours if medication change or upwards trend
Moderate 5.5 – 5.9 mmol/L	RAAS halve dose Or stop most recently added RAAS agent Drugs, hypovolemia Calcium polystyrene	Repeat within 72 hours Continued $K^+ > 5.5$ stop 1 RAAS agent
Severe > 5.9 mmol/L	RAAS inhibitors stop Immediate assessment 12 lead ECG Treat according protocol	Repeat 4 to 24 hours Depending on ECG and local protocol

The Canadian Cardiovascular Society Heart Failure Companion: Bridging Guidelines to Your Practice. Can J Cardiol. 2015;32(3):296-310
Canadian Cardiovascular Society Consensus Conference recommendations on heart failure update 2007. Can J Cardiol. 2007;23(1):21-45

Diet

Vegetables

- Potatoes
- Tomatoes

- Leafy greens
- Spinach
- Brussel sprouts

- Beans, lentils
- Winter squash

- Beets
- Avocado

Fruits and nuts

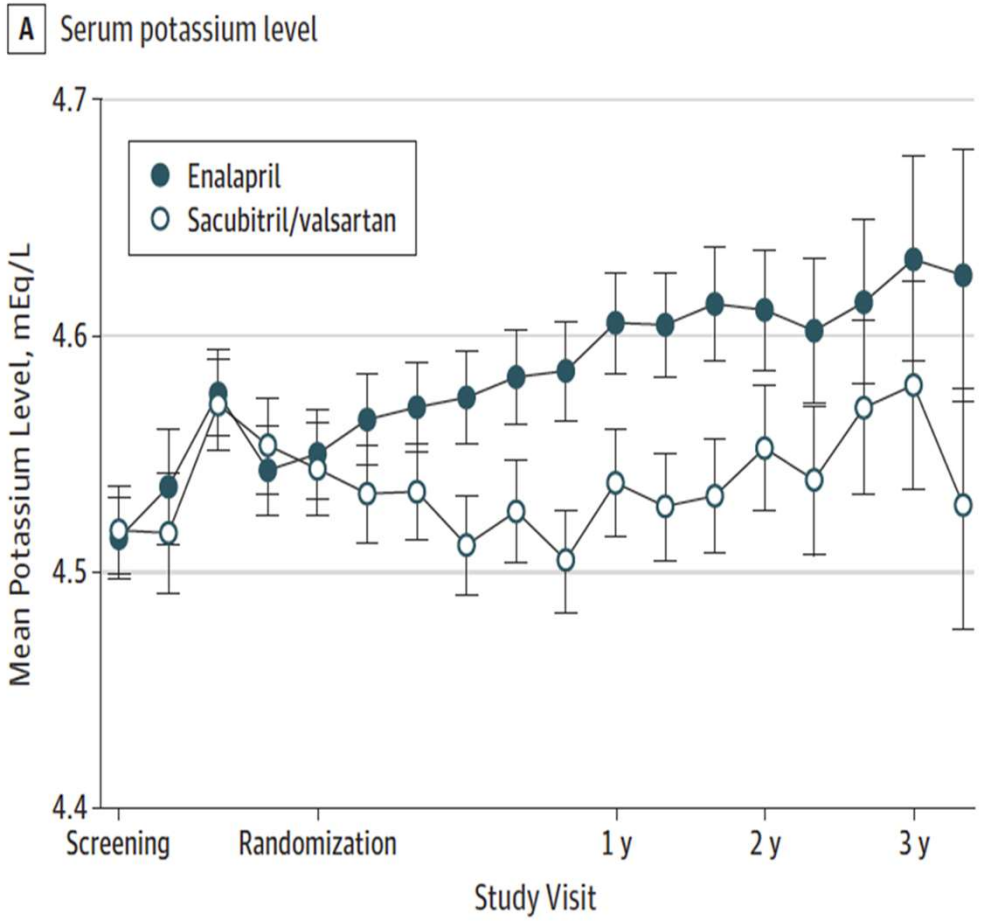
- Bananas
- Orange and grapefruit
- Melon
- Apricots
- Dried fruits, raisins

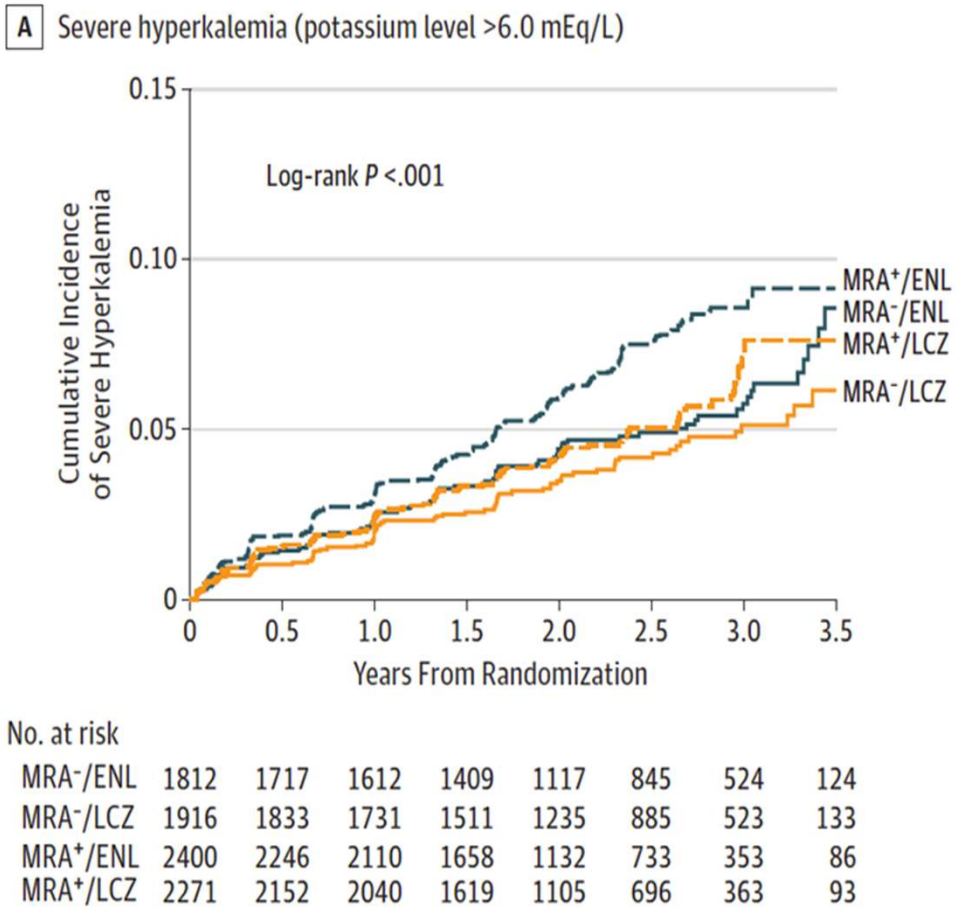
- Cashews
- Almonds

Other

- Milk (all types)
- Yoghurt
- Granola

Risk of hyperkalemia with sacubitril-valsartan (ARNI) is lower than ACEI





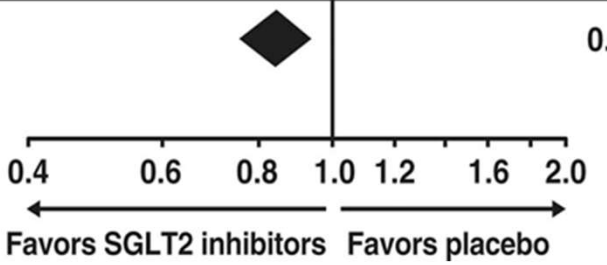
No. at risk

MRA⁻/ENL	1812	1717	1612	1409	1117	845	524	124
MRA⁻/LCZ	1916	1833	1731	1511	1235	885	523	133
MRA⁺/ENL	2400	2246	2110	1658	1132	733	353	86
MRA⁺/LCZ	2271	2152	2040	1619	1105	696	363	93

Desai et al. JAMA Cardiol. 2017 2(1):79-85

Risk of hyperkalemia is lower with concurrent SGLT2I

	SGLT2 inhibitors		Placebo		Hazard Ratio (95% CI)
	n/N	Events per 1000 patient-years	n/N	Events per 1000 patient-years	
CANVAS Program	137/5795	8.2	85/4347	9.2	0.89 (0.67, 1.17)
CREDENCE	121/2202	21.6	154/2199	27.9	0.77 (0.61, 0.98)
DAPA-CKD	159/1455	56.9	179/1451	65.3	0.88 (0.71, 1.09)
DECLARE-TIMI 58	53/8582	1.6	78/8578	2.3	0.67 (0.47, 0.95)
EMPA-REG OUTCOME	216/4687	17.2	124/2333	20.5	0.83 (0.67, 1.04)
VERTIS CV	291/5493	18.7	157/2745	21.2	0.90 (0.74, 1.09)
Overall (I^2=0.0%; $P_{heterogeneity}$=0.71)					**0.84 (0.76, 0.93)** P<0.001



Neuen BL, et al. Circulation. 2022;145:1460-147

Potassium binders

	Sodium polystyrene sulfonate (Kayexalate)	Sodium zirconium cyclosilicate
Recommended dose	Oral: 15 g, 1–4 times daily Rectal: 30–50 g, 1–2 times daily	10 g 3 times daily for up to 48 hours Then once daily.

Hyperkalemia, Renal Dysfunction & Individualized Therapies

Management of Hyperkalemia

Severity	Initial Management	Reassessing K+	Restarting and/or re-titrating ACEi/ARB/ARNI and/or MRA
Mild K+ 5.0-5.5 mmol/L	• Continue ACEi/ARB/ARNI & MRA unless new & major increase in K+ • If so, stop most recently added agent	• Routine measurement unless K+ has been increasing over time • If ACEi/ARB/ARNI and/or MRA has been stopped, recheck within 72 hours	• When K+ decreases to within the patient's usual level, or < 5.0 mmol/L (whichever is higher), *and* • Any concomitant condition contributing to recent changes is under control, then • ACEi/ARB/ARNI and MRA should usually be reintroduced 1 at a time with intervening measurement of renal function & electrolytes
Moderate K+ 5.6-5.9 mmol/L	• Notify MD/NP (if applicable) • If on MRA, decrease MRA to half current dose* • If not on MRA, decrease ACEi/ARB/ARNI to half current dose* *Unless K+ increasing over time or major increase in K+ • If so, stop most recently added agent	• Within 72 hours • Repeated K+ >5.5: If on MRA, decrease ACEi/ARB/ARNI to half of current dose; If not on MRA, stop ACEi/ARB/ARNI • Repeat measurement in 72 hours • Subsequent repeated K+ >5.5: consider calcium or sodium polystyrene, or sodium zirconium cyclosilicate administration	
Severe K+ >5.9 mmol/L	• Notify MD/NP (if applicable) • Contact patient to proceed to ED for clinical assessment & 12-lead ECG • Treatment according to local protocol for serious hyperkalemia • HOLD all ACEi/ARB/ARNI & MRA until reassessment	• Within 4-24 hours, based on local acute hyperkalemia protocol • Repeat approximately 72 hours later	

For ALL hyperkalemic patients:

- Reinforce K+ diet restriction
- Avoid other sources of K+
- Ensure patient is not hypovolemic
- Review all medications & stop K+ supplements

Management of Renal Dysfunction

If increase in sCr > 30% or decrease in eGFR > 30%

Consider:	
• Any new nephrotoxic drugs? • Worsening HF? • Co-morbidities (diabetes, dehydration, CKD)?	Review medications, assess volume status and notify MD/NP (if applicable)

Post-Titration Considerations for Individualized Therapies

Ivabradine → If sinus rhythm, symptoms and HR > 77bpm on 3 consecutive visits by ECG or continuous monitoring despite treatment with GDMT, including target dose or maximally-tolerated dose of beta blocker

Hydralazine/Nitrate → If intolerant to ACEi/ARB/ARNI, or in Black patients on optimal GDMT

Digoxin → If suboptimal rate control for Afib, or persistent symptoms despite optimal GDMT

Vericiguat → If worsening symptoms and HF decompensation in the last 6 months despite optimal GDMT

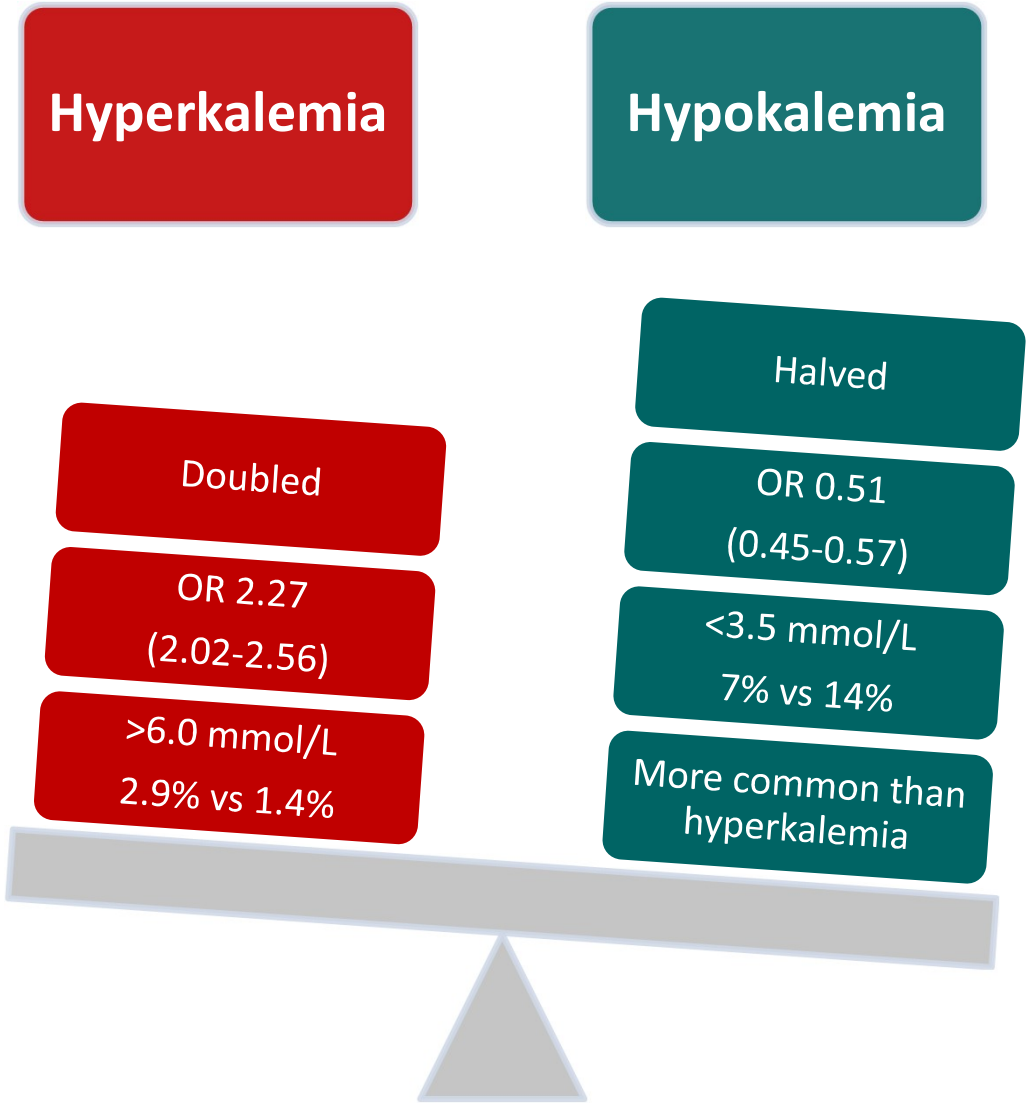
ICD/CRT → If LVEF ≤ 35% when reassessed 3 months after GDMT titrated to target or maximally tolerated doses, and if patient is ambulatory with NYHA class I-IV - refer for ICD/CRT evaluation

Percutaneous Mitral Valve Repair (PMVR) → If symptomatic despite optimal GDMT and moderate-to-severe functional mitral regurgitation or greater - refer to a MitraClip/TEER Program

Referral for advanced HF therapies and/or referral for supportive/palliative care → If NYHA III/IV, advanced HF or high-risk markers (refer to CCS 2017 HF Guidelines)

https://www.cardiacbc.ca/Documents/HFrEF%20GDMT%20Pathway_Nov%204%202025.pdf

MRA hyper vs hypokalemia



- Meta-analysis
- 4 trials:
  - RALES (spironolactone)
  - EMPHASIS (eplerenone)
  - TOPCAT (spironolactone)
  - FINEARTS-HF (finerenone)

Jhund et al. Lancet 2024.

Reviewed on: November 4, 2025

Medications for Heart Failure with Reduced Ejection Fraction (EF)

What is the most effective treatment for heart failure with reduced EF?

- Taking the right medications as soon as possible after your diagnosis can help you live longer, feel better, do more, and stay out of hospital.
- The most effective treatment is a set of four medications that work together:

ACE-inhibitor/ARB/ARNI
e.g. ramipril, perindopril, candesartan, sacubitril/valsartan (Entresto®)

Beta Blocker
e.g. bisoprolol, carvedilol, metoprolol

MRA
e.g. spironolactone, eplerenone

SGLT2 Inhibitor
e.g. dapagliflozin, empagliflozin (Jardiance®)

- These medications work as a team to slow down your heart rate, relax the blood vessels to reduce the workload on your heart, and prevent stiffening or scarring of the heart tissue. They can also help your heart pump better, improve your EF, and protect your kidneys.
- Some people with this condition also take a diuretic, or "water pill."

What should you expect when you start taking these medications?

- You will start with low doses. Your health care provider will increase your medications based on your heart failure symptoms, any medication side effects, and your blood test results.
- You may feel some improvement in your heart failure symptoms about a month after you start taking these medications.
- It usually takes about three months to get to the right dose for you. Most people need to keep taking these medications for life, even if their EF improves.
- Serious side effects are rare. Some people feel mild side effects like lightheadedness, dizziness, and/or low energy after dose changes.

How can you get the most benefit from these medications?

- **Do your best to get blood tests done on time.** You'll need more blood tests during the first three to six months of taking these medications to help your health care provider adjust your doses to the right levels for you.
- **Get to know the Heart Failure Zones** (www.cardiacbc.ca/hf). You can use the Zones to help you monitor your symptoms and know when to get help.
- **Don't stop or change your medication doses on your own**. If you think you're having side effects, talk to your health care provider or pharmacist first.
- **Try a few tools to help you take your pills on the same schedule every day**. Some people use a pill organizer, blister packs, or set reminders on their phone or watch. Most pharmacies can put your medications into a blister pack.
- **Tell your health care provider about all traditional medicines, natural medicines, or over-the-counter products you are taking.** This helps your health care provider work with you to make sure all your treatments work well together and to avoid harmful side effects.
- **Keep an up-to-date list of your medications in your wallet or on your phone**. This can help you bring health care providers up to date quickly, especially if you're travelling, or in an emergency situation.

How can you get help with medication costs?

- **Fair PharmaCare** helps BC residents with the cost of prescription medications, based on income. To learn more, visit: gov.bc.ca/gov/content/health/health-drug-coverage or call 1-800-663-7100
- **PharmaCare Plan W** covers prescription medications for First Nations people in BC. To learn more, visit fnha.ca/benefits/pharmacy or call 1-855-550-5454

How can you contact a pharmacist after hours?

HealthLink BC's pharmacists can provide information about medications, how they work, and side effects. They are available when your community pharmacy may be closed. Call 8-1-1 to speak with a pharmacist from 5pm-9am, 7 days per week.

Where can you learn more?

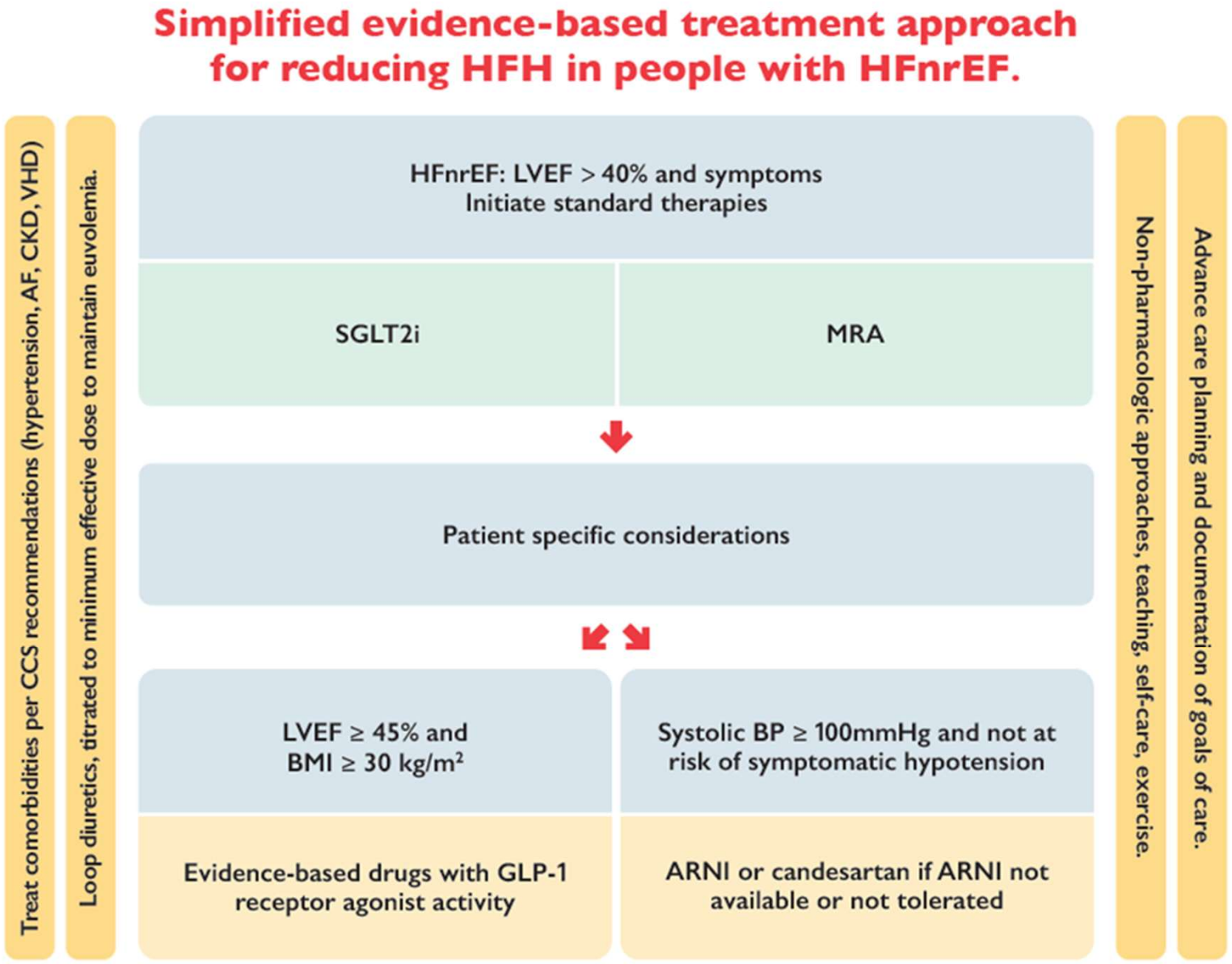
Watch the educational video series: Healthy Living with Heart Failure at www.cardiacbc.ca/hf

HeartLife FOUNDATION *This document was developed in collaboration with HeartLife Foundation.*

Scan to watch videos.

https://www.cardiacbc.ca/Documents/HFrEF%20Medications%20Patient%20Handout_Nov%204%202025.pdf

HFnrEF



CCS guidelines 2025

HFpEF structural abnormalities

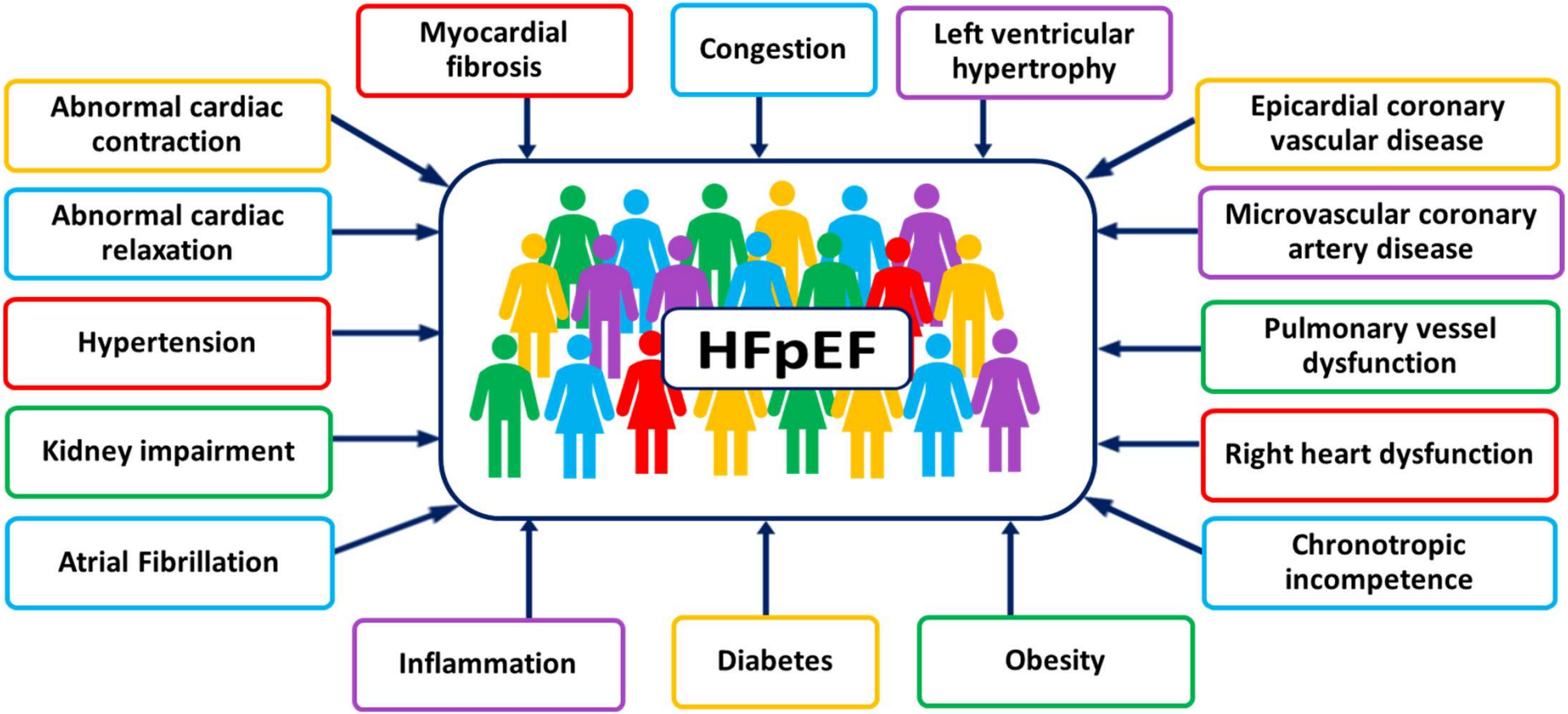
The diagnosis of HF-PEF requires three conditions:

1. Symptoms and signs of HF
2. LVEF ≥50%
3. Objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised NPs

- LV mass index ≥95 g/m2 (Female), ≥115 g/m2 (Male)
- LA volume index >34 mL/m2 (SR) >40 mL/m2 (AF)
- E/e' >9
- NT-proBNP >125 (SR) or >365 (AF)
- BNP >35 (SR) or >105 (AF)
- PAP >35 mmHg

McDonagh TA, et al. Eur Heart J. 2021;42:3599-3726

HFpEF is a complex comorbid disease

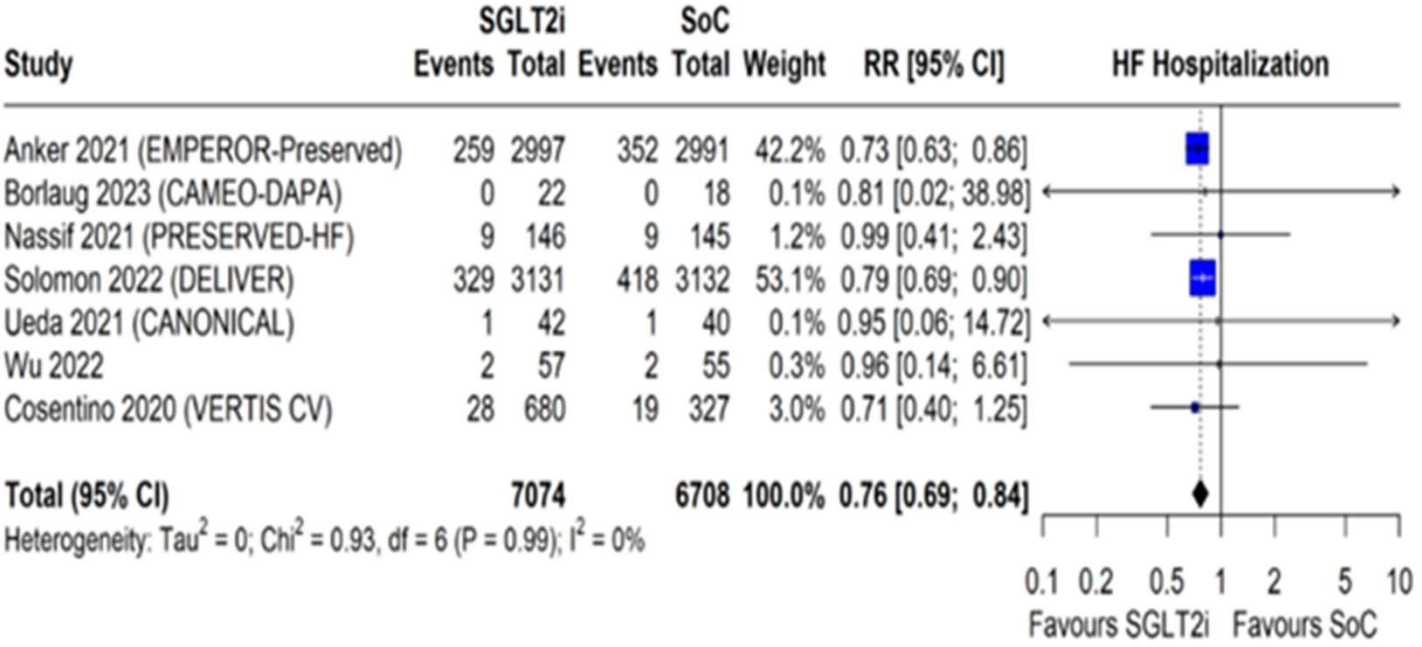


Campbell P, et al. Lancet. 2024;403:1083-1092

SGLT2i in HFnrEF reduces HF hospitalization

- Reduction in heart failure hospitalization (HFH)
  - ~11 HFHs fewer per 1,000 patients (95% CI, 14 fewer to 7 fewer)

- Compared to standard of care
  - Significantly improved functional status
  - Numerically improved 6MWD by 7.15 m (95% CI, -4.1 to 18.4)
  - No increase adverse events or serious adverse events



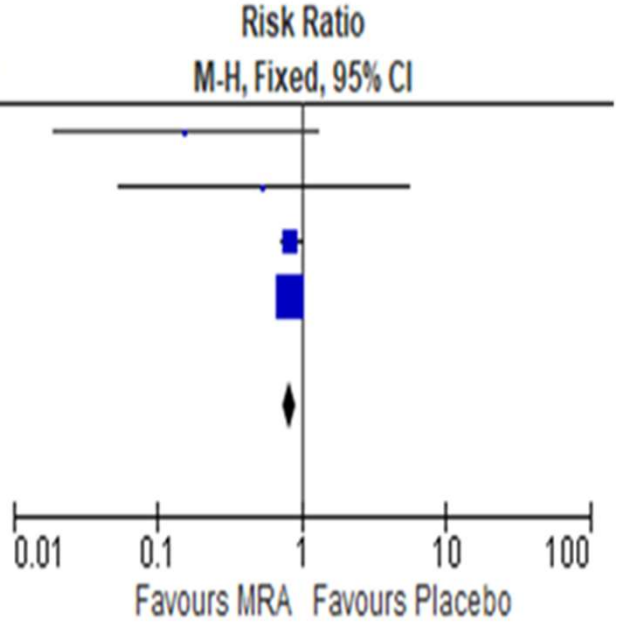
MRA in HFnrEF reduces HF hospitalization

- Reduction in heart failure hospitalization (HFH)
  - ~29 HFHs fewer per 1,000 patients
- Compared to standard of care
  - No difference in CV mortality, functional class
  - No difference withdrawal rates

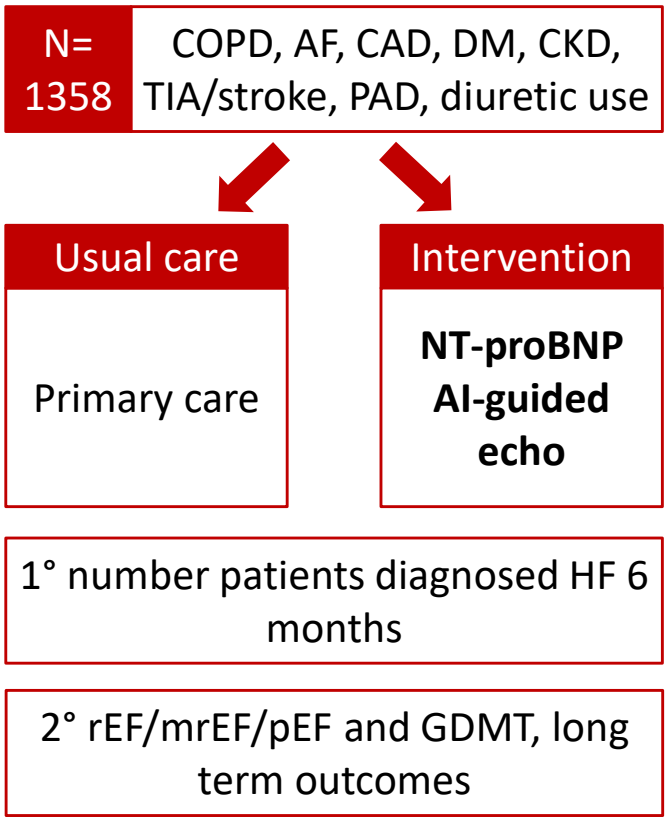
Study or Subgroup	MRA Events	MRA Total	Placebo Events	Placebo Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year
AREA IN-CHF	1	116	6	109	0.7%	0.16 [0.02, 1.28]	2009
RAAM-PEF	1	21	2	23	0.2%	0.55 [0.05, 5.61]	2011
TOPCAT	206	1722	245	1723	29.6%	0.84 [0.71, 1.00]	2014
FINEARTS-HF	479	3003	573	2998	69.4%	0.83 [0.75, 0.93]	2024
Total (95% CI)		4862		4853	100.0%	0.83 [0.76, 0.91]	
Total events	687		826				

Heterogeneity: Chi² = 2.57, df = 3 (P = 0.46); I² = 0%

Test for overall effect: Z = 3.92 (P < 0.0001)

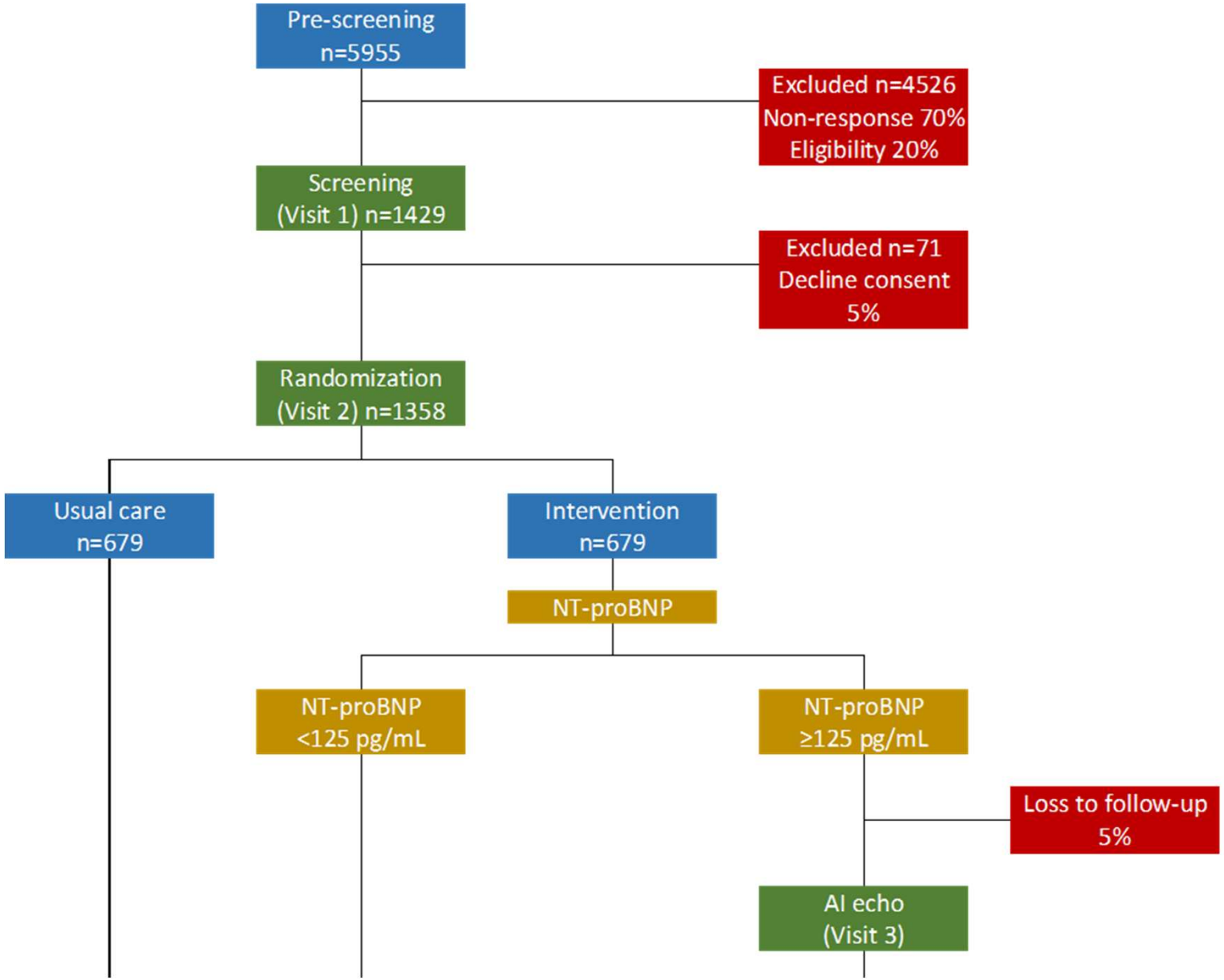


Multidisciplinary Approach for high-risk Patients Leading to Early diagnosis in Canadians with Heart Failure (MAPLE-CHF)

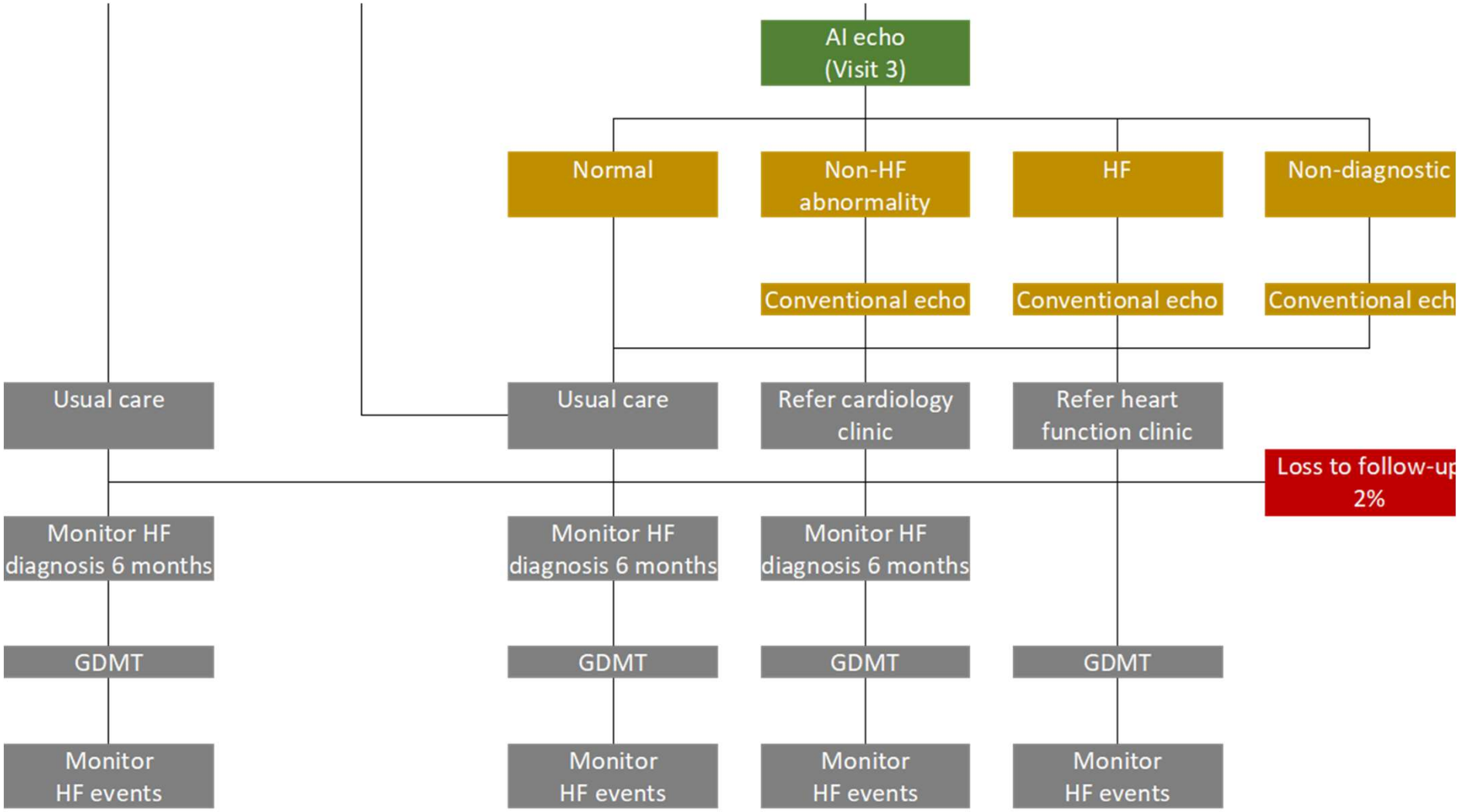


- Pre-screening through electronic health records
- NT-proBNP local labs
- AI guided acquisition and interpretation

Screening and randomization



Imaging and follow-up



Conclusion

- HFrEF (LVEF ≤40%): quadruple therapy with ARNI, BB, MRA, and SGLT2I
- SGLT2I and MRA are core therapies across the spectrum of ejection fraction
- The CSBC toolkit provides practical implementation guidance
- Severe worsening renal function and hyperkalemia are uncommon and manageable
- To be part of MAPLE-CHF email: nat.hawkins@ubc.ca

Questions?