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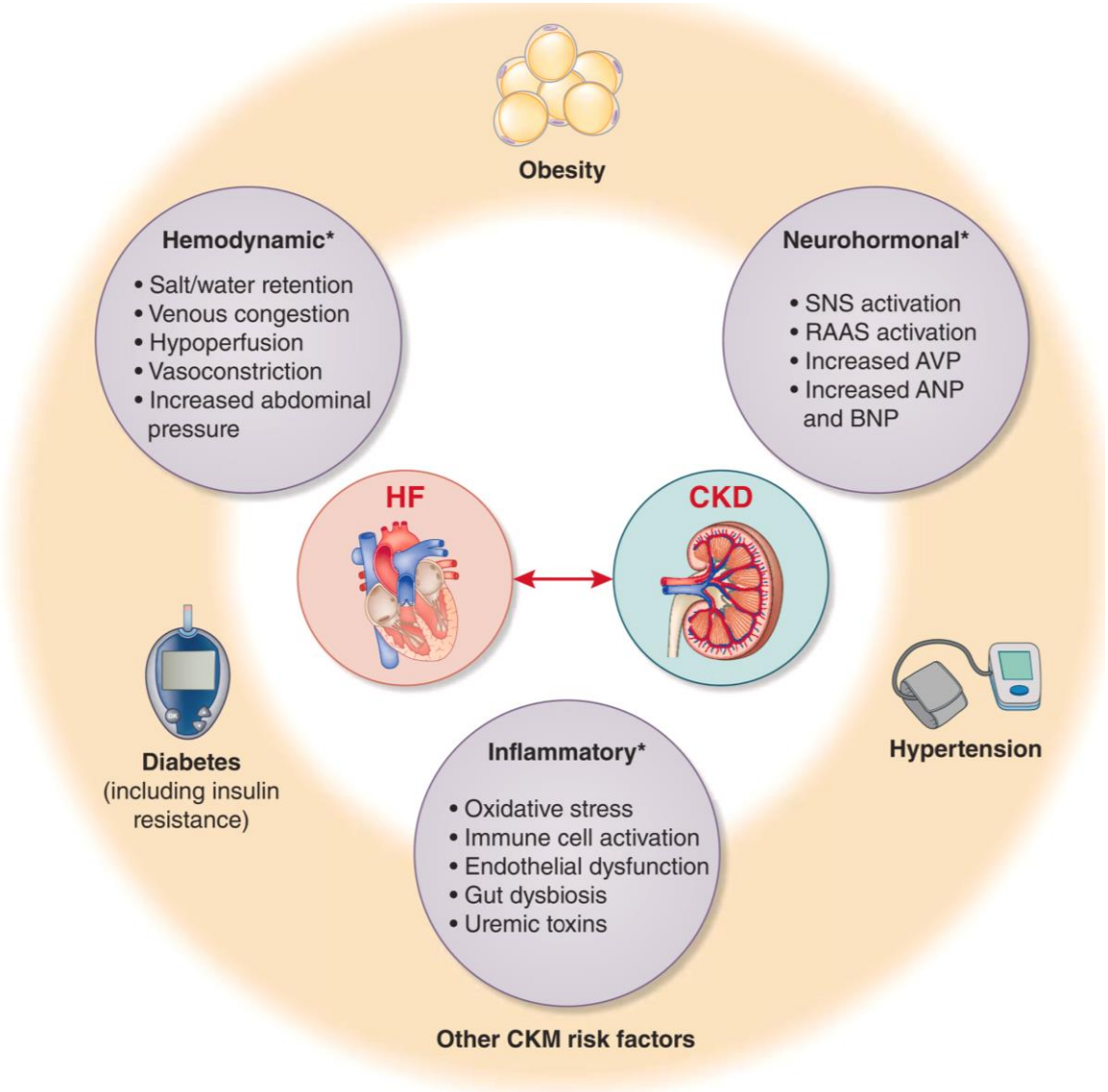
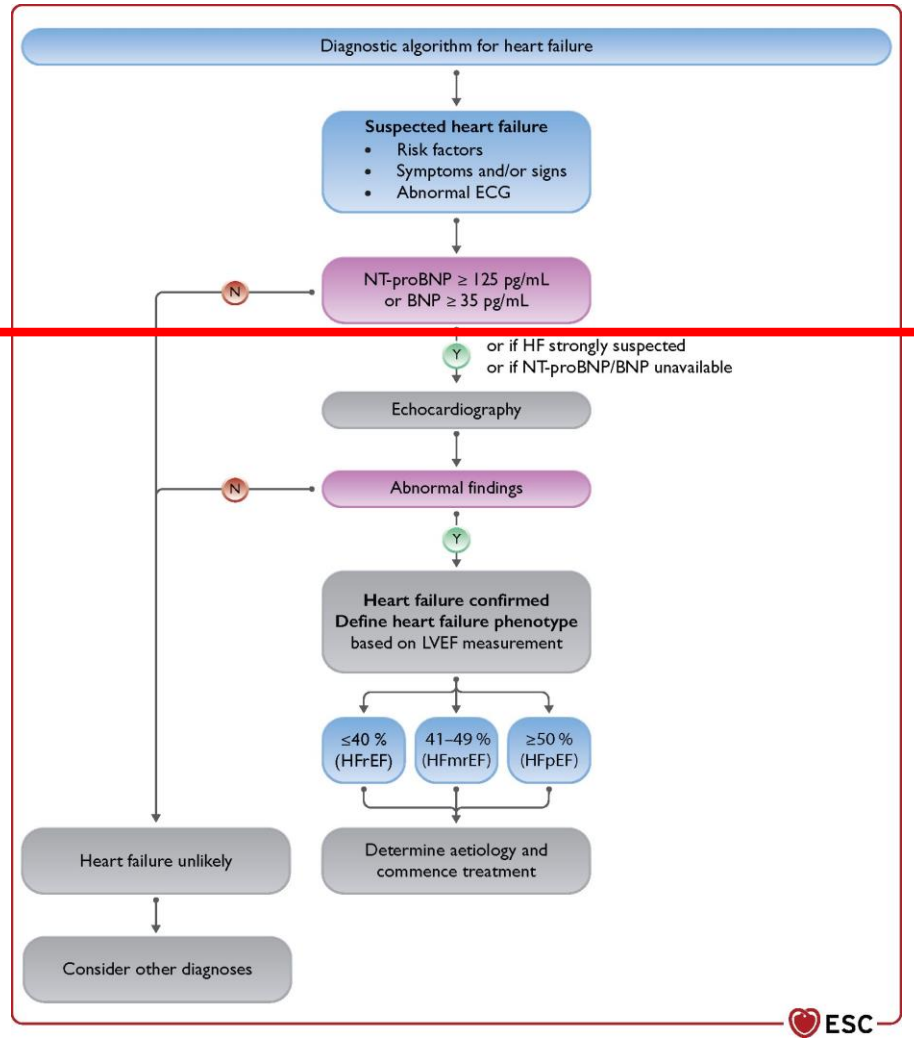
Cardio-renal syndrome: perspectives

Dr Dominique Auger, MD, PhD, FESC, FRCPC
Consultant Cardiologist
Heart Failure, CMR and echocardiography
Imperial College Healthcare NHS Trust



*Some of these pathways may lead to end-organ fibrosis.

Definition of heart failure



Heart failure is caused by any structural or functional cardiac disorder that impairs the heart's ability to function efficiently as a pump to support circulation. (NICE,2018)

"The FINAL common pathway for the many cardiac conditions that affect the heart pump function"

ESC European Society of Cardiology
European Heart Journal (2026) **47**, 927–938
https://doi.org/10.1093/eurheartj/ehaf675

FASTTRACK – CLINICAL RESEARCH
Heart failure and cardiomyopathies

Benefit of early initiation of disease-modifying therapy in community-based patients with suspected heart failure

Kieran F. Docherty [1,*], Benjamin Heywood [2], Antoni Bayes-Genis [3], Ross T. Campbell [1], Alasdair D. Henderson [1], Pardeep S. Jhund [1], Lars Køber [4,5], Morten Schou [5,6], Scott D. Solomon [7], Muthiah Vaduganathan [7], Jil Billy Mamza [8], Christopher Ll Morgan[2], Katrina Mullin[9], Ruiqi Zhang[8], Mark C. Petrie [1], and John J.V. McMurray [1]

[1]School of Cardiovascular & Metabolic Health, BHF Cardiovascular Research Centre, University of Glasgow, Glasgow G12 8TA, UK; [2]Human Data Sciences, Cardiff, UK; [3]CIBERCV, University Hospital Germans Trias i Pujol, Badalona, Barcelona, Spain; [4]Department of Cardiology, Rigshospitalet, Copenhagen University Hospital, Hellerup, Denmark; [5]Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark; [6]Department of Cardiology, Copenhagen University Hospital, Herlev and Gentofte Hospital, Hellerup, Denmark; [7]Cardiovascular Division, Brigham and Women's Hospital, Boston, MA, USA; [8]Medical and Scientific Affairs, BioPharmaceuticals Medical, AstraZeneca UK Limited, London, UK; and [9]Cardiovascular, Renal and Metabolism Global Medical Affairs, BioPharmaceuticals Medical, AstraZeneca, Cambridge, UK

Received 18 July 2025; revised 5 August 2025; accepted 16 August 2025; online publish-ahead-of-print 29 August 2025

See the editorial comment for this article 'Guideline-recommended preventive management in metabolic and renal disease: a paradigm shift for all healthcare professionals to maintain 'normal' cardiac function', by J. Bruno *et al.*, https://doi.org/10.1093/eurheartj/ehaf681.

Abstract

Background and Aims The initiation of heart failure (HF) therapies at the time of detection of an elevated N-terminal pro-B-type natriuretic peptide (NT-proBNP) level in community-based patients with suspected HF may reduce the risk of early adverse outcomes. The aim of this analysis was to estimate the potential benefit of the early initiation of a sodium-glucose cotransporter 2 inhibitor (SGLT2i) and/or mineralocorticoid receptor antagonist (MRA) in patients with suspected HF and a pre-existing non-HF-related indication for treatment.

Methods A cohort study was performed from 1 January 2015 to 31 March 2023 using linked primary and secondary care data from the Clinical Practice Research Datalink (CPRD). Patients without a history of HF and who were not prescribed an SGLT2i or MRA were followed up for 12 months following a community-measured NT-proBNP ≥ 400 pg/mL. The primary outcome was a composite of a HF hospitalization as the first recorded HF diagnostic event or death from any cause in patients without a documented HF diagnosis during follow-up and who did not undergo echocardiography. The effect of the initiation of treatment with an SGLT2i, MRA, or both (effective treatments for HF regardless of ejection fraction) was modelled at the time of NT-proBNP measurement in patients with a pre-existing non-HF-related indication for these drugs (Type 2 diabetes, chronic kidney disease, or resistant hypertension) using treatment effect estimates from meta-analyses of randomized placebo-controlled trials in patients with established HF.

Results An NT-proBNP ≥ 400 pg/mL was recorded in 74 945, 24 082 (32%) of whom had a HF diagnosis recorded within 12 months, 15 398 (64%) as an outpatient and 8684 (36%) during a HF hospitalization. If both an SGLT2i and MRA were commenced at the measurement of an elevated NT-proBNP in those with a pre-existing non-HF-related indication, we estimated that for every 1000 patients treated, 84 would avoid either a HF hospitalization or death at 12 months, equating to a number needed to treat of 12 (95% confidence interval 11–14).

* Corresponding author. Email: kieran.docherty@glasgow.ac.uk

Finerenone--NICE

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Contraindications and cautions

- **Do not prescribe finerenone to people** with:
  - An eGFR of less than 25 mL/min/1.73m^2.
  - Serum potassium level greater than 5.0 mmol/L.
  - Severe hepatic impairment.

Finerenone is recommended as an option for treating stage 3 and 4 chronic kidney disease (with albuminuria) associated with type 2
Serum potassium and estimated glomerular filtration rate (eGFR) have to be measured to determine if finerenone treatment can be in
and to determine the starting dose.

- If serum potassium ≤ 4.8 mmol/L, finerenone treatment can be initiated.
- If serum potassium > 4.8 to 5.0 mmol/L, initiation of finerenone treatment may be considered with additional serum potassium
- monitoring within the first 4 weeks, based on the person's comorbidities and subsequent serum potassium levels.
- If serum potassium > 5.0 mmol/L, finerenone treatment should not be initiated.

- Additionally, finerenone can only be initiated if the person has an estimated glomerular filtration rate (eGFR) of 25 ml/min/1.73 m^2 or
  - If the person's eGFR is between 25 and 60 ml/min/1.73 m^2 the starting dose should be 10 mg finerenone.
  - In people who have an eGFR > 60 ml/min/1.73 m^2 the starting dose should be 20 mg finerenone.

GLP1 agonists

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- HFpEF

- Better quality of life
- More exercise tolerability
- Studies ongoing

HFrEF

Increase in Heart rate, ?signal towards more events

Consideration for renal function

Decongestion

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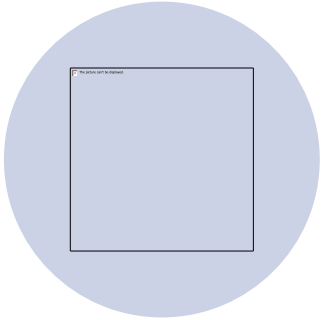
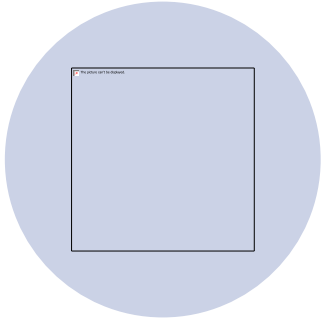
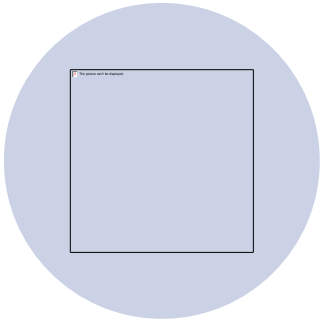


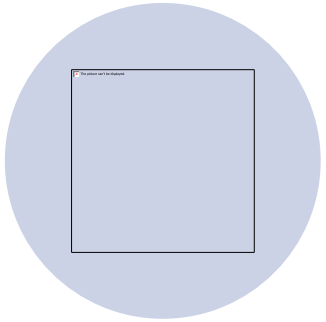
Important to treat symptoms



Renal function may improve with offloading

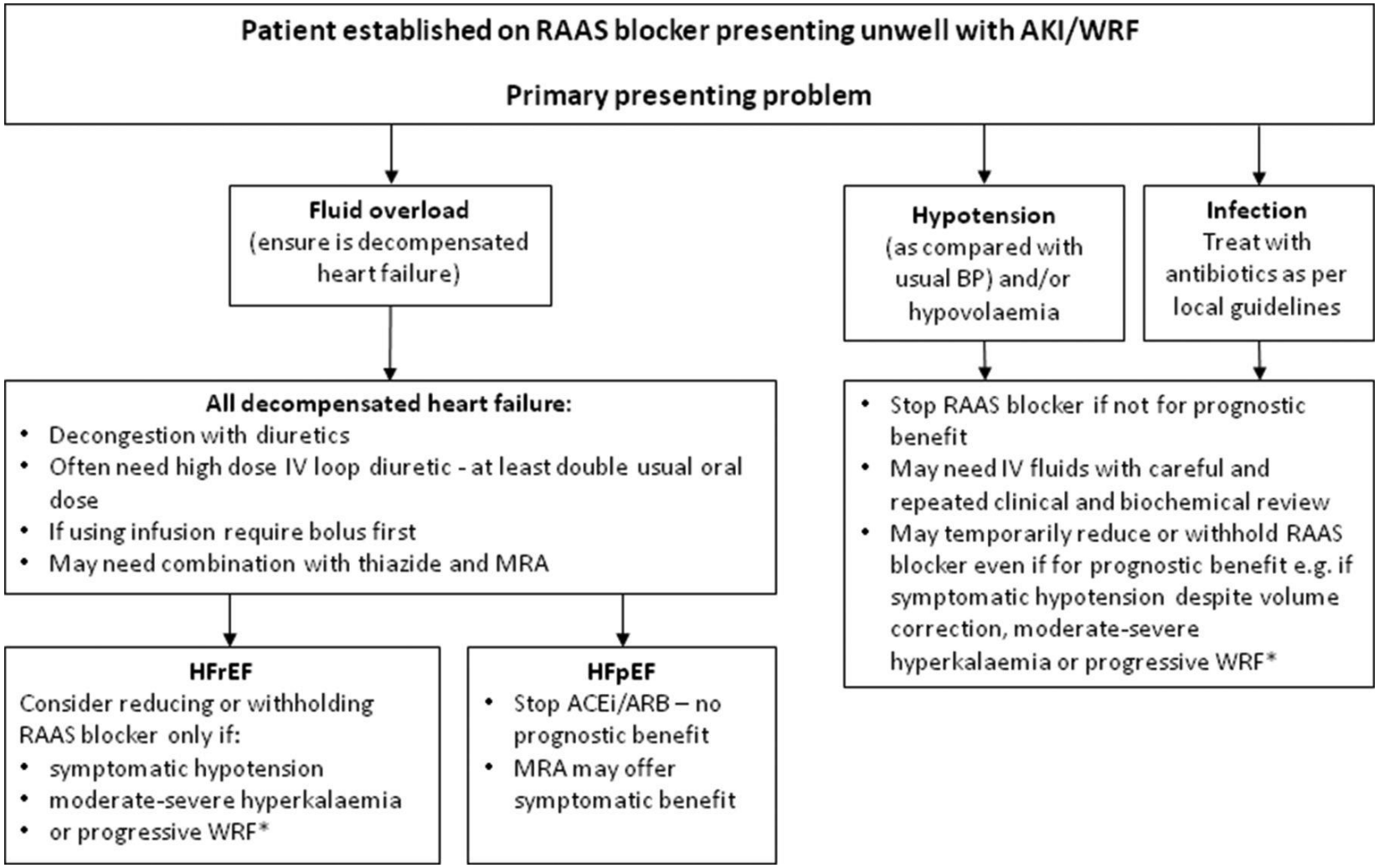


Once offloaded, maintenance dose of diuretics should be sought



Fluid restriction: not routinely

Management of patients with AKI or worsening renal function who are receiving RAAS inhibitor.



Andrew L Clark et al. Heart 2019;105:904-910

A fall in eGFR (and rise in creatinine) is very common after initiation of RAAS inhibitors but usually stabilises.

- A progressive fall in GFR on RAAS inhibition suggests primary renal disease, including extrarenal and intrarenal vascular disease.
- For patients with HFrEF, the benefit of RAAS inhibitors is greater in patients with worsening renal function during RAAS inhibition despite their worse prognosis relative to those with no decline.
- A moderate, asymptomatic decline in renal function is not an indication to stop RAAS inhibitors.

Sodium Zirconium Cyclosilicate

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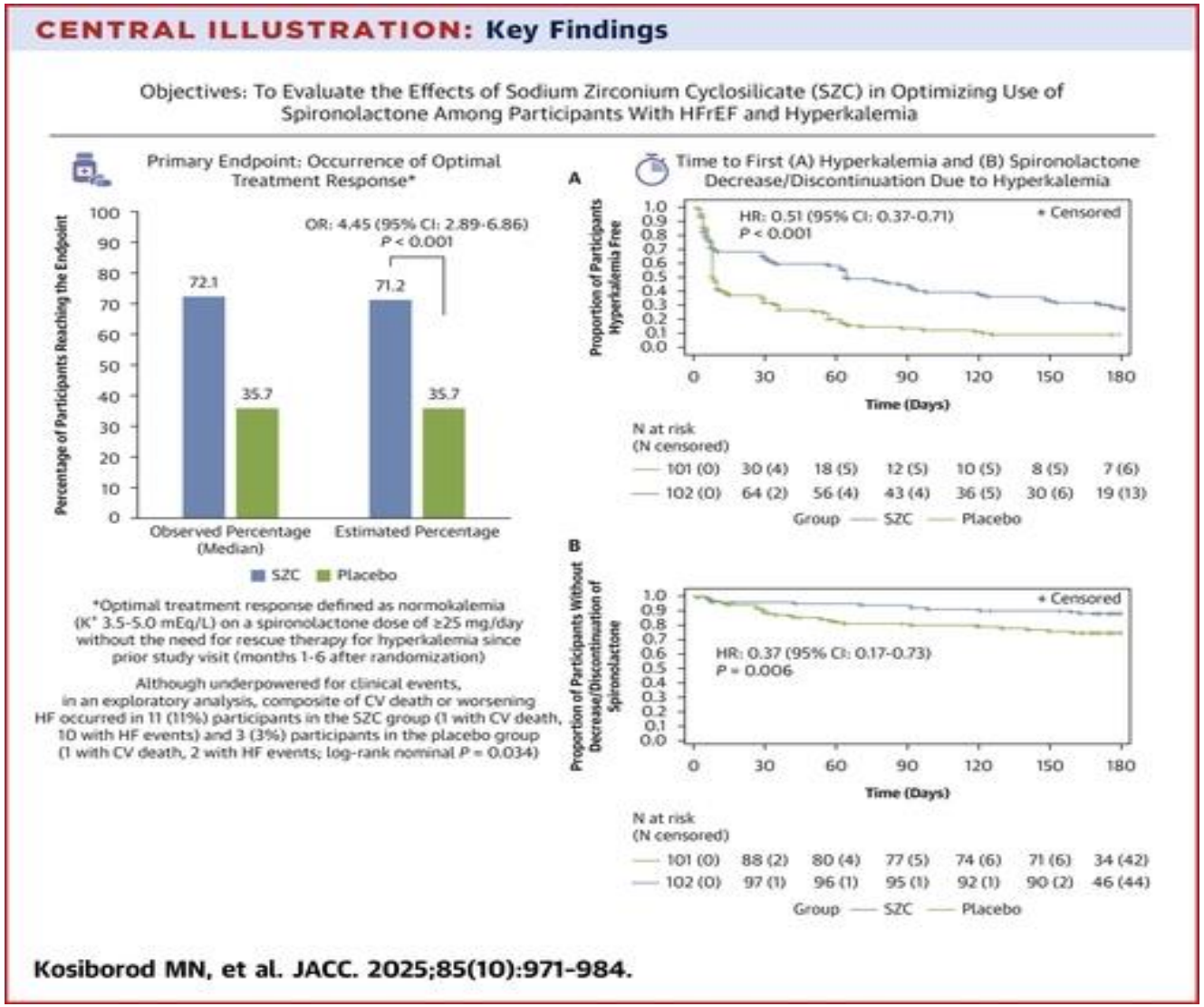

Kosiborod MN, et al. JACC. 2025;85(10):971-984.

Virtual ward and remote monitoring

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- Early rapid optimization (within 6 weeks, blood tests in ambulatory patients or with district nurses)
- Admission avoidance: weight increase, worsening renal function
- Hospital at home model, IV diuresis at home
- Frailty

GIRFT: to the rescue with advice and guidance

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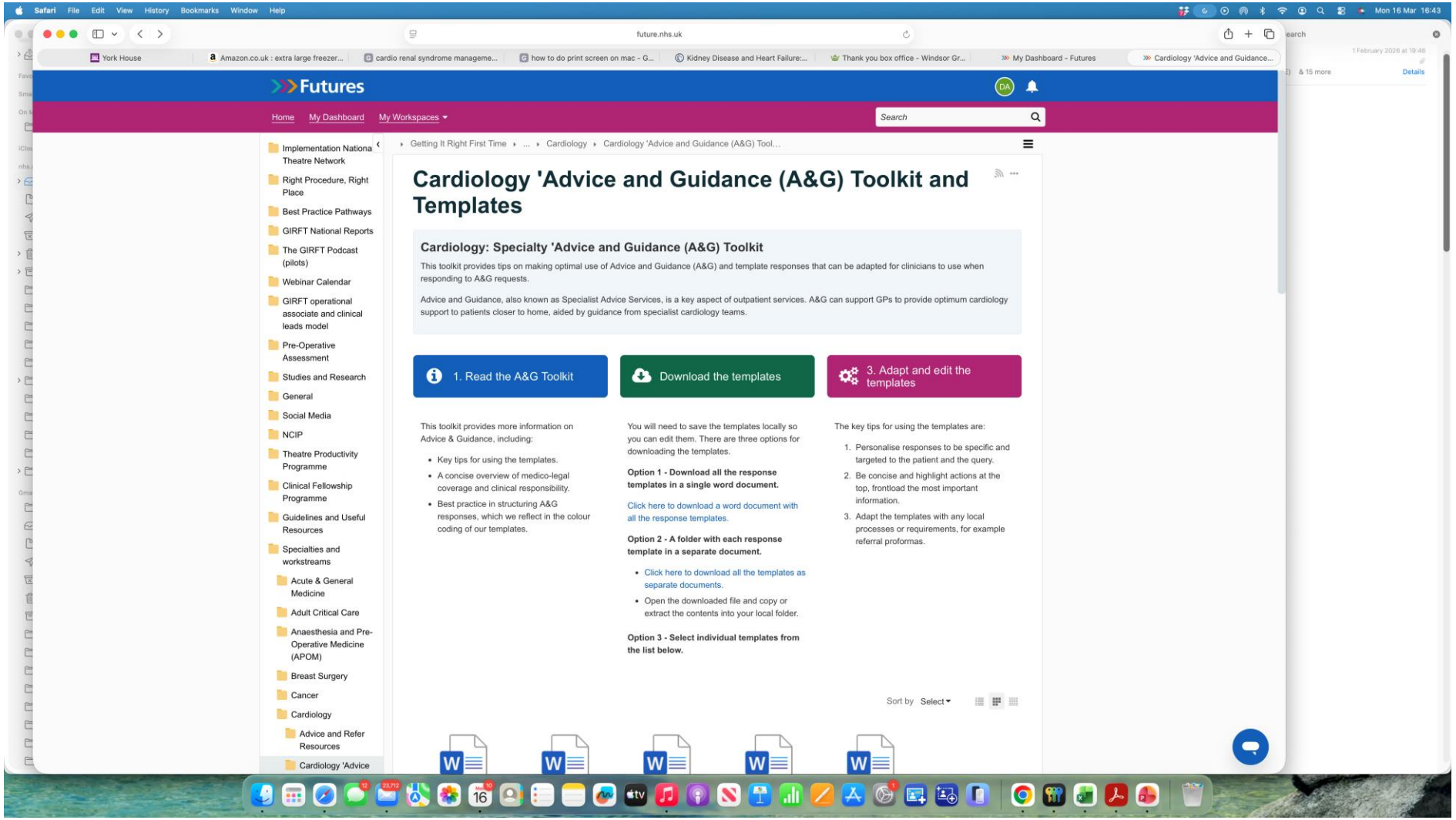

Heart failure with preserved ejection fraction

Dear [Dr ____],

Advice and guidance response pertaining to [Patient name].

Heart Failure (HF) is a clinical syndrome based on symptoms and signs in conjunction with an elevated NT-proBNP and is classified depending on left ventricular ejection fraction (LVEF) measurements. A normal NT-proBNP makes a diagnosis of heart failure very unlikely.

HF with preserved EF, HFpEF accounts for the majority of all HF diagnosis and is particularly associated with an older and multimorbid population. With age, hypertension, diabetes, coronary artery disease, obesity, the heart tends to get stiffer. It pumps adequately but struggles to fill up (diastolic dysfunction) and manages to do so under great pressure. The ventricle becomes increasingly dependent on left atrial contraction to fill. This contributes to left atrial dilatation which in turns favours atrial fibrillation.

HFpEF is defined as HF with EF of ≥ 50%. This is normal seen in combination with a structural and/or functional change

Treatment of HF with preserved EF (LVEF 50% or more):

- If clinically fluid overloaded, add a loop diuretic for symptomatic relief.
- Treat comorbidities: optimal diabetes control, optimal BP control, weight loss, exercise, AF rate control (and consideration of anticoagulation for AF, see page 34), sleep apnoea.
- Consider SGLT2 inhibitor.
- Consider MRA especially if right sided features/fluid overload.
- Often co-exists with frailty - consider an MDT approach to management including community services.

Advice on the common management for all patients with heart failure including lifestyle advice can be found on the accompanying pre-referral heart failure guide (link to be added when published).

Consider emergency admission or same-day discussion with on-call cardiology team for patients with heart failure when:

- Severe dyspnoea at rest especially if evidence of acute pulmonary oedema (widespread crepitations) with associated haemoptysis/frothy pink sputum.
- Patients with ongoing cardiac chest pain, signs of hypoperfusion (cool clammy skin, cyanosis, pallor), compromise from syncope, brady or tachycardia need assessment in their own right.

Refer to Heart Failure Clinic (note: local pathways/echo access may vary):

- New patient with NT-proBNP > 2000 pg/ml should be referred to a rapid access clinic and have an echo within 2 weeks and a specialist review.
- New patients with NT-proBNP 400-2000 pg/ml – echo and review within six weeks.
- Worsening HF in a patient with a known diagnosis despite optimal GDMT.

Seek A&G directed toward the HF team rather than clinic review when:

- Patients with an established diagnosis of HF with new deterioration of symptoms or are reaching end of life.
- Patients who cannot attend hospital appointments (e.g. some care home patient)
- Patients with severe competing comorbidities in whom treatment of HF is unlikely to improve quality of life.
- NT-proBNP < 400 pg/ml with persistent symptoms where heart failure is still suspected despite the low likelihood.
- Electrolyte disturbances and renal function management (see hyperkalaemia template for more information).
- Low BP (see management of hypotension template for more information).

Management of hypotension with heart failure

Dear [Dr ____],

Advice and guidance response regarding [Patient name]

General information:
Hypotension both symptomatic and asymptomatic can present challenges to clinicians caring for ambulatory chronic heart failure patients but it is advisable to continue the guideline directed medical therapies (GDMT) where safe to do so.

An individualised approach should be taken for people living with heart failure and co-morbid frailty and falls, when the benefits and side effects of ALL medications should be carefully considered. In general, where possible, small doses of all 4 pillars of GDMT is optimal although the patient should be counselled for risks and this should be reviewed regularly. For heart failure with reduced EF ≤40% or mildly reduced ≤49% this is likely to consist of the four pillars of HF management namely betablockers, ACE/ARB or ARNI, MRA, SGLT2i; for heart failure with preserved EF ≥50% this is likely to consist of SGLT2i and MRA. Where medications have been temporarily suspended in the setting of acute illness, plans or criteria should be put in place for restarting when possible.

If asymptomatic - continue irrespective of BP

For symptomatic patients with hypotension and HF:

- Check for volume depletion and encourage normal fluid intake without restrictions.
- In clinically euvolaemic patients or volume depleted patients consider reducing loop or thiazide diuretics. Patients should be advised to monitor for symptoms of congestion how to report them. If they are known to the community heart failure team they should be advised to make contact.
- Consideration should be given to adjusting timing of medications so that doses of blood pressure reducing medications can be spaced out across the day.
- Maintaining small doses of all 4 pillars of GDMT is beneficial in HFrEF, down titration of one or more pillars may enable all 4 classes of medications to continue at low doses.
- For patients on an ARNI (sacubitril valsartan), consider switching back to ACE/ARB. **Please note a 36-hour washout period is required for patients switching between ACE Inhibitor and sacubitril valsartan.**
- Review any antianginal medication and in particular consider stopping oral nitrates if stable angina symptoms.
- Review/discontinue other medication potentially causing hypotension e.g. alpha blockers.
- Please inform heart failure nurse specialist teams if the patient is being actively managed by the service and GDMT or diuretics are being amended.

When to refer:

- If ongoing symptoms despite the above messages, refer for further advice. Contact the heart failure specialist team in the first instance if the patient is already known to them.
- Patients with tachyarrhythmia who are not tolerating beta-blockers due to hypotension.
  - Patients with known moderate to severe aortic stenosis who might be candidates for aortic valve intervention.
- Down titration of heart failure medications due to tolerability issues is associated with poorer outcomes. In patients who are clearly not candidates for advanced heart failure management strategies consideration should be given as to whether the patient may be approaching end of life and may need to change treatment focus to symptom control, with integration of palliative care services.

Links to relevant national guidance, local guidelines and pathways:

Essential

www.bsh.org.uk

info@bsh.org.uk

Coding isn't optional - it is life saving

HEART FAILURE SNOMED CODES:

HFrEF: 703272007 AND **LVSD:** 407596008 *always list BOTH*

HFmrEF: 788950000

HFpEF: 446221000