Document control

Version	Revision	Upload date	Notes
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Management of Chronic Heart Failure in Primary Care & Outpatient Setting

Contents

Introduction and Purpose

This document is for utilisation across the NHS in C&M for any prescribing clinician involved in the management of chronic heart failure. For primary care, the intention is to provide practical information in safely optimising medical therapies within clinician's competencies and formulary guidance, whilst raising awareness of when specialist treatments may be an option. We acknowledge, there is considerable variation in heart failure service provision across C&M, some areas will have GPs and/or NMP's who have completed the heart failure module training for PWSI, whilst other areas may need a lower threshold to refer to the local heart failure service provision.

It has been adapted from, both the legacy Cheshire and Mersey Heart Failure (HF) Pathway 2021, and the heart failure treatment decision aids, for use across Cheshire and Mersey ICS to support the effective management and optimisation of HF therapies in line with national guidance across primary care. The document is in line with national (NICE, 2022, updated September 2025), and European guidelines (European society of cardiology, 2021) (ESC, 2023), and best evidence base. The Cheshire and Mersey Heart Failure (HF) Pathway 2021 has been archived as it is now out of date due to changes in heart failure treatments, and currently there is no capacity or funds to update this preferred end-to-end holistic pathway. The NICE HF guideline update from September 2025 has been incorporated in this document and supports non-specialist clinicians beyond the guidelines with practical support on how to safely initiate, monitor and problem-solve HF therapies.

***The main changes include**:*

- 4-pillar HF optimisation using the person's medical history, clinical assessment results, frailty status, prognosis and preferences when deciding when and how to optimise medicine doses (rather than the traditional model on starting ACEi →BB →MRA → SGLT2i → ARNI) in HFrEF
- 4-pillar HF optimisation in HFmrEF

Provided by
North West Coast Cardiac Network
Cheshire and Merseyside Area Prescribing Group
ICB approval date: 18 Feb 2026 Version 1.0
Review February 2029 or earlier if there is significant new evidence relating to this recommendation

- ARNI remains specialist initiation for GP to continue once stable if EF ≤40%-updated GP letter included
- Recommendation of MRA and SGLT2i in HFpEF
- Consider lower starting does or smaller dose increments in CKD
- Consider IV iron for HFrEF if remain symptomatic on 4-pillar therapy
- Minor changes to the layout from Stage 3 in the Cheshire and Mersey Heart Failure (HF) Pathway 2021 to produce the chronic heart failure management summary.

Summary of Management of Chronic Heart Failure in Primary Care & Outpatient Setting

Table 1 Overview of heart failure (HF) treatment based on Echocardiogram (ECHO) diagnosis

<table>
<tr><td>General</td><td colspan="3">

If possible discontinue aggravating drugs, e.g., NSAID, Verapamil, Diltiazem and thiazolinediones
Address non-pharmacological & self-care measures, e.g. smoking, alcohol, fluid intake, diet (salt intake), exercise, obesity. Utilise patient held record of treatment, weight, risk factors etc
Check treatment adherence and seek early advice if symptom deterioration
Annual influenza, and once only pneumococcal immunisation
Primary or secondary prevention of atherosclerotic cardiovascular disease (ASCVD)*. Optimise chronic disease management, esp. diabetes (DM), chronic kidney disease (CKD) and hypertension
Refer to cardiac rehabilitation and/or community heart failure services, according to local service provision and criteria

</td></tr>
<tr><td rowspan="8">Treatment Summary

**
Green – Primary Care takes full responsibility for prescribing and monitoring

AR - Amber Recommended by Specialist advised and can be primary care initiated

AI - Amber Initiated by specialist until stabilisation of the dose is achieved and the patient had been reviewed by the specialist.

A RET - Amber Patient Retained specialist initiation of prescribing until stabilisation of the dose is achieved and the patient had been reviewed by the specialist. Patient remains under the care of specialist (i.e. not discharged) as occasional specialist input may be required.</td><td colspan="3">A – Assess for Signs of Congestion
e.g. oedema, lung crackles, raised JVP, or pulmonary oedema on chest x-ray</td></tr>
<tr><td colspan="3">

Start oral loop diuretic (Furosemide or Bumetanide) (GREEN) and stop existing thiazides e.g. Bendroflumethiazide
If already on loop diuretics, increase dose or switch Furosemide to Bumetanide if signs of congestion

</td></tr>
<tr><td colspan="3">B -Treatment with Guideline Directed Medical Therapy (GDMT**)
**GDMT improves HF morbidity and mortality and should be maintained at maximum tolerated doses long-term where possible.

If clinically safe and appropriate, patients can be considered for rapid optimisation of HF treatments with frequent. Intensive monitoring & review, as research (Safety, tolerability and efficacy of up-titration of guideline-directed medical therapies for acute heart failure, STRONG-HF) shows a reduction in hospital readmission &death. Not all patients will tolerate this approach, especially if frail or with significant co-morbidities hen slower titration may be preferable and careful patient selection is necessary.</td></tr>
<tr><td>HFrEF: Left ventricular ejection fraction (LVEF)<=40%</td><td>HFmrEF: LVEF >40 & <50%</td><td>HFpEF: LVEF =>50%</td></tr>
<tr><td>Offer to <u>all</u> people with HFrEF
Initiate and titrate to <u>maximum tolerated dose,</u>
1. ACEi (ACE inhibitor) (GREEN) (Appendix A)
○ If ACE not tolerated - offer ARNI (AI)
○ If ACEi and ARNI not tolerated - offer ARB (Angiotensin Receptor Blocker) (GREEN)
2. BB (Beta-blocker) (GREEN) (Appendix B)
3. MRA (Mineralocorticoid Receptor Antagonist) (GREEN) (Appendix C)
4. SGLT2i (SGLT2 Inhibitor) (AR) (Appendix E)</td><td>Consider initiation and titration to maximum tolerated dose,
1. ACEi, or ARB if ACE not tolerated (GREEN)
2. BB (GREEN)
3. SGLT2i (AR)
4. MRA (GREEN)</td><td>Consider initiation and titration to maximum tolerated dose,
1. MRA (GREEN)
2. SGLT2i (AR)</td></tr>
<tr><td colspan="3">C – Ongoing Symptoms

Ensure maintenance and maximum tolerated doses of GDMT as above
Use diuretics for the relief of fluid retention symptoms and encourage patient self-management to titrate diuretic therapy (up and down) according to the lowest dose required. Combination of loop and thiazide/thiazide-like diuretics (AR) may be recommended by HF specialists if diuretic resistence
Continue to optimise treatment of significant co-morbidities that may impact on HF symptom control.
Monitor for new complications e.g. Atrial Fibrillation, new cardiac chest pain, new heart murmur

</td></tr>
<tr><td colspan="2">

Consider replacing ACEI (or ARB) with an ARNI (AI)
Consider adding Ivabradine (AI) if LVEF<=35% and resting HR=>75bpm and sinus rhythm (do not use if AF or supraventricular arrythmia) (Appendix D)
HF specialist assessment or HF multidisciplinary team (MDT) discussion for,

</td><td>Consider specialist assessment or HF MDT discussion for worsening or ongoing symptoms.</td></tr>
</table>

	1. **Cardiac resynchronisation therapy** (CRT), with implantable cardiac defibrillator, CRT-D, or without CRT-P, if, a. LVEF<=35% and ECG: QRS interval =>130ms 2. **IV Iron** if anaemia with haemoglobin (HB)<150g/L plus iron deficiency with, a. Transferrin saturation <20%, or, b. Ferritin <100ng/ml c. Do not assume iron deficiency is due to the patient's heart failure. Please ensure the aetiology of iron deficiency anaemia is defined and investigated appropriately. d. Low dose Digoxin (AR) (even in sinus rhythm, SR). Aim for serum levels 0.7-1.0mcg/L in people without AF (do not use with Ivabradine) e. Hydralazine (AI) and Nitrate (GREEN) if above GDMT not tolerated.	
	Implantable cardiac defibrillators (ICDs) for Heart Failure: Consider for, • Primary Prevention: If New York heart association score (NYHA) II-III and LVEF <=35% despite 2 months optimal GDMT and >1 year life expectancy. • Secondary Prevention: For people recovered from haemodynamically unstable ventricular arrythmia and >1 year life expectancy	

* ASCVD – Atherosclerotic Cardiovascular Disease, e.g., Coronary heart disease, Stroke/TIA, peripheral arterial disease (includes aortic aneurysm).

** GDMT improves HF morbidity and mortality and should be maintained at maximum tolerated doses long-term where possible

*** See appropriate appendix/algorithm for medication optimisation recommendations of ACE, ARB, ARNI, BB, MRA, SGLT2i, Ivabradine

Chronic heart failure: 6–12-month condition and therapy review guide

Patients with chronic heart failure will see a variety of clinicians depending on their severity and co-morbidities. It is the responsibility of all who treat chronic heart failure patients to ensure regular review of their therapy and management plan. The frequency of this review will depend on the stability of symptoms but should be 6–12 monthly as a minimum. The reviewing clinician should ensure the following,

Table 2 Summary of Chronic Heart Failure Review Process

<table>
<tr><td>1. Understand the Diagnosis</td><td>Confirm the original echo diagnosis and cause of heart failure to direct GDMT as per Table1 to ensure GDMT prescribed is appropriate. Ensure patients are coded correctly on the healthcare record.
• Heart failure with reduced ejection fraction: 703272007 and LVSD: 407596008 (EF ≤40%)
• Heart failure with mildly reduced ejection fraction: 788950000 (EF 41-49%)
• Heart failure with preserved ejection fraction: 446221000 (EF ≥50%)</td></tr>
<tr><td>2. NYHA score</td><td>Evaluation of the New York Heart Association (NYHA) score, and change since previous assessment, as a measure of impact of GDMT, or possible new complication e.g., Atrial Fibrillation, new cardiac murmur, new undiagnosed cardiac sounding chest pain, or worsening heart failure symptoms.
<table><tr><td>NYHA I: No limitation to normal physical activity</td><td>NYHA II: Slight limitation to normal physical activity which may cause fatigue and/or breathlessness. Comfortable at rest.</td></tr><tr><td>NYHA III: Marked limitation to less than normal physical activity which may cause fatigue and/or breathlessness. Comfortable at rest.</td><td>NYHA IV: Unable to carry out any activity without worsening symptoms. Heart failure symptoms present at rest.</td></tr></table></td></tr>
<tr><td>3. Check GDMT optimised and maintained with appropriate</td><td>Ensure maintenance of GDMT at optimal doses with appropriate physical and blood test checks
• History – check for,</td></tr>
</table>

essential safety checks and consideration of new complications, fluid overload, or worsening symptoms	○ New onset chest pain ○ Increased breathlessness on exertion, orthopnoea or PND ○ New palpitations • Examination – check ○ BP ○ Pulse, consider target heart rate and assess regularity to consider undiagnosed atrial fibrillation ○ Heart sounds for possible new heart murmur ○ Consider- Pulmonary or peripheral oedema, JVP, ascites • Blood tests – check ○ FBC and iron studies ○ Renal function ○ Other tests according to co-morbidities and medications (e.g., HBA1c, lipids, TFTs etc)
4. Review diuretics	Following fluid overload assessment - review the need to continue, reduce, stop or increase diuretic therapy
5. Consider palliative stage heart failure & Referral to Palliative Services	Check for possible disease progression to palliative stage heart failure. Consider if a combination of, • NT pro-BNP>2000 at diagnosis • Repeated hospital admissions • Advancing age • Complex ventricular arrythmias • Complex multimorbidity (esp. CKD, COPD, DM and anaemia) • Declining tolerance of, and response to, treatment, esp. if NYHA 3-4 despite maximal GDMT
6. Review of co-morbidities and polypharmacy	Review of heart failure in context of optimising co-morbidities, including polypharmacy and stopping unnecessary or unhelpful mediations to avoid risk of AKI, falls and increasing ACBS (anticholinergic burden score).
7. Make Every Contact Count	Opportunity for additional CVD prevention ensuring effective approach to ABC (AF, Blood pressure and Cholesterol). MECC to recommend CVD prevention lifestyle changes (alcohol, smoking, diet, weight and activity).
8. Tailored patient education	• How to manage fluid balance and tailored self-management of diuretics. • Understanding heart failure and its treatment including sick day rules and restarting therapies after intercurrent illness. • Driving and when to inform DVLA. • Contraception. • Advanced planning including support on ICD deactivation. • Signposting to talking therapies and social prescriber support. • Signpost to additional information e.g., Pumping marvellous

Table 3: Tips on managing common chronic heart failure problems

Hypotension	• Stop non-HF medications that lower BP if possible. • If dehydrated clinically, and/or biochemically, reduce or stop diuretics with consideration of fluid overload risk and CKD. Discuss with HF/renal team if complex. • If bradycardic on BB, reduce dose – no sudden stopping if possible (risk of rebound tachycardia). • If persistent or symptomatic seek HF team advice.
Atrial Fibrillation	• If ventricular rate (VR) >90 bpm, increase BB, or add oral Digoxin if BP low • If VR>110 bpm despite maximal oral therapy, seek specialist assessment to consider Amiodarone +/- direct current cardioversion (DCCV) +/- Ablation • If new onset AF => 24 hours with fast VR, refer to hospital. • Consider anti-coagulation, see local AF Thromboprophylaxis Pathway
Unresponsive to GDMT	• Consider day-case SC/IV diuretics via Cardiac Ambulatory Unit or Heart Failure Virtual Ward or local service provision. • In people resistant to loop diuretics, consider adding Bendroflumethiazide or Metolazone (2nd line), following HF team review and advice. • Discussed with Cardiologist if heart transplantation (or bridging therapy) could be considered. • If persistent hyperkalaemia (>6.0), seek specialist assessment to consider potassium binders.

When to seek specialist support	• Worsening symptoms despite maximal therapies • Complex decision making, e.g., complex multimorbidity making therapeutic decisions difficult • For consideration of specialist therapies or interventions, e.g., ARNI, CRT, transplant • New complications or worsening symptoms requiring investigations such as updated ECHO, e.g., new heart murmur, new arrythmia, new cardiac sounding chest pain • Support with advancing heart failure and palliative stage

Appendix A: Algorithm for the use of Renin-Angiotensin Aldosterone System Inhibitors (RAASi) in Chronic Heart Failure – ACE (GREEN)/ ARNI (AI)/ ARB(GREEN)

Indications Confirmed HFrEF and HFmrEF

For choice of therapy according to LVEF, see Table 1 for full details.
HFrEF – Initiate and titrate ACE (ACE inhibitor) to maximum dose
- If ACE not tolerated - offer ARNI (Angiotensin-Neprilysin Inhibitor), sacubitril/valsartan
- If ACE and ARNI not tolerated - offer ARB (Angiotensin Receptor Blocker)
- If ongoing HF symptoms on ACEi/ARB change to an ARNI (sacubitril/valsartan)

HFmrEF – initiate and titrate ACEi to maximum dose or switch to an ARB if ACEi not tolerated

Contra-indications

ACE Inhibitors (GREEN)

Contraindications:
- History of angioedema
- Known bilateral renal artery stenosis
- Pregnancy/risk of pregnancy
- Known allergic/adverse reaction

Cautions/seek specialist advice:
- Significant hyperkalaemia (K+ >5.0 mmol/L).
- Significant renal dysfunction (creatinine >221mol/L or eGFR <30 mL/min/1.73 m2)
- Symptomatic or severe asymptomatic hypotension (SBP <90 mmHg)

Angiotensin Receptor Neprilysin Inhibitors (ARNI) (HFrEF only) (AI)

Contraindications:
- History of angioedema
- Known bilateral renal artery stenosis
- Pregnancy/risk of pregnancy and breastfeeding period
- Known allergic/adverse reaction
- Symptoms of hypotension or a SBP <100 mmHg at initiation
- Severe hepatic impairment, biliary cirrhosis and cholestasis
- Concomitant use with aliskiren in patients with diabetes or eGFR <60 ml/min/1.73m²

Cautions:
- A washout period of at least 36 hours after ACE therapy ceases is required to minimize the risk of angioedema
- eGFR <30 mL/min/1.73 m2
- Significant hyperkalaemia (K+ >5.4 mmol/L).

Initiation of RAAS Inhibitors – General Principles

Stop potassium supplements/potassium sparing diuretics apart from Spironolactone or Eplerenone	Monitor sitting & standing blood pressure before & after each dose increment
Educate patient about purpose, benefits & side effects.	Monitor for adverse effects (see below)
Check U&E prior to initiation & following each titration step.	Titrate at 1-2 weekly intervals to target dose or max tolerated dose

Prescribing

ACE Initiation & Titration - Ramipril 1st line choice

- Start Ramipril at 1.25mg-2.5mg once daily.
- Increase gradually as per table below.
- Only titrate following U+E check after each dose increment

Titration Step	Daily Dose of Ramipril
Day 1	1.25mg daily
1-2 weeks	2.5mg daily or 1.25mg twice a day
3-4 weeks	5mg daily or 2.5mg twice daily
5-6 weeks	10mg daily or 5mg twice a day

Smaller incremental increases can be considered in,
- Frailty
- Elderly
- Hypotensive
- Renal impairment – eGFR <45mls/min
- People on loop diuretics
- If Creatinine Clearance <60mls/min, total max daily dose 5mg

ARNI Initiation & Titration - Sacubitril/Valsartan

- ARNI should be initiated by a clinician with HF specialist training
- STOP ACEi or ARB 48 HOURS BEFORE COMMENCING TREATMENT WITH SACUBITRIL/VALSARTAN
- Start at usual dose Sacubitril 49mg/Valsartan 51mg twice a day.
- Start low dose Sacubitril 24mg, Valsartan 26mg twice a day if:
- Previously taking low dose ACEi/ARB
- Mod-severe renal or hepatic impairment
- Systolic BP 100-110 mmHg
- eGFR ≤ 45mls/min
- Counsel on increased risk of dizziness and provide PIL and alert card

Increase gradually as per table below.
Only titrate following U+E check after each dose.

Titration Step	Daily Dose Sacubitril/Valsartan
Day 1 (if low dose ACEi/ARB)	24/26mg twice a day
Day 1 (or increase after 2-4 weeks if started on low dose ARNI 24/26mg)	49/51mg twice a day
2-4 weeks (4-6 weeks if started on low dose ARNI initially)	97/103mg twice a day

If not commenced in primary care, the initiating service must inform the patients GP that Sacubitril/Valsartan has been commenced and any repeat prescription for ACE/ARB should be stopped utilsing the Template GP letter on the Cardiac Network website.

- If ARNI is not tolerated and reversion back to ACEi or ARB is considered, the 48-hour wash out period needs to be applied.

<table>
<tr><td></td><td>ARB: Intolerance to ACE or ARNI – see Stage 3: Management of Chronic Heart Failure for place in therapy
• Consider Candesartan 4mg daily titrated to 32mg daily or maximum tolerated dose using the same principles described for ACE.
• Increase gradually at intervals of 1-2 weeks as per table below.
• Only titrate following U+E check after each dose increment.

<table><tr><td>Titration Step</td><td>Daily Dose of Candesartan</td></tr><tr><td>Day 1</td><td>4mg daily</td></tr><tr><td>1-2 weeks</td><td>8mg daily</td></tr><tr><td>3-4 weeks</td><td>16mg daily</td></tr><tr><td>5-6 weeks</td><td>32mg daily</td></tr></table></td></tr>
<tr><td></td><td>Hydralazine & Nitrate: Intolerance to ACE, ARNI & ARB – see Stage 3: Management of Chronic Heart Failure for place in therapy

• Seek specialist advice to consider Hydralazine & Nitrate therapy, if appropriate,
- Hydralazine 25mg twice a day, PLUS,
- Isosorbide mononitrate (ISMN) MR 30mg daily
• Increase Hydralazine as tolerated to 25mg three times a day, and further titrations up to a maximum daily dose of 300mg (split over three or four times a day dosing). Increase ISMN MR to max 120mg daily (seek specialist advice) according to response.</td></tr>
<tr><td>Interactions</td><td>Potassium supplements, Potassium-sparing diuretics (eg. Amiloride, Traimterne), NSAIDs, Trimethoprim
Concomitant use with ACE inhibitors or ARBs is not recommended</td></tr>
<tr><td>Common side effects and problem solving</td><td>Cough - Common in patients with HF, many of whom have smoking-related lung disease, but also a symptom of pulmonary oedema, which should be excluded when a new worsening cough develops. When a troublesome cough does develop (e.g. one stopping the patient from sleeping) and can be proved to be due to ARNI and ACE-I (i.e. recurs after the drugs withdrawal and re-challenge), substitution of an ARB is recommended.
Worsening renal function and hyperkalaemia
• A rise in urea, Cr and K+ is expected after initiation of RAASi; if an increase is small and asymptomatic, no action is necessary.
• An increase in Cr up to 50% baseline or 266µmol/L/eGFR <25mls/min is acceptable
• An increase in K+ up to <5.5 mmol/L is acceptable.
• If urea, Cr, or K+ does rise excessively, consider stopping concomitant nephrotoxic drugs (e.g. NSAIDs) and other K+ supplements or retaining agents (triamterene, amiloride) and, if no signs of congestion, reducing the dose of diuretic.
• If greater rises in Cr or K+ than those outlined above persist despite adjustment of concomitant medications, the dose of the ACE-I, ARNI or ARB, should be halved and blood chemistry re-checked within 1-2 weeks; if there is still an unsatisfactory response, specialist advice should be sought.
• If K+ rises to >5.5 mmol/L or Cr increases by >100% or to >310 µmol/L (3.5 mg/dL)/eGFR <20ml/min, the ACEI, ARNI or ARB should be stopped and specialist advice sought.
• If K+ rises to >5.5 mmol/L ACEi/ARNI/ARB should be stopped and specialist advice sought to consider potassium binders
• Blood chemistry should be monitored more frequently until K+ and Cr have stabilised

Symptomatic hypotension
• Dizziness/light-headedness is common and often improves with time—patients should be reassured.
• Reconsider need for any other vasodilators and reduce dose/stop, if possible.
• If no signs or symptoms of congestion, consider reducing diuretic dose.
• If these measures do not solve problem, temporary down-titration or discontinuation of sacubitril/valsartan is recommended. Seek specialist advice</td></tr>
</table>

Appendix B: Algorithm for the use Beta-blocker (GREEN) in Chronic Heart Failure with reduced ejection fraction (HFrEF) or mildly reduced EF (HFmrEF)

Indications	• Confirmed heart failure with reduced or mildly reduced ejection fraction (EF) • To improve symptoms, reduce the risk of HF hospitalisation and increase survival
Contra-indications	Beta-Blocker contraindicated in: • Severe asthma (carvedilol CI in any asthma or bronchospasm) • 2nd /3rd degree AV Heart Block/sick sinus syndrome • Acute heart failure requiring inotropic therapy • Critical limb ischaemia • Combination with verapamil and diltiazem • See SPC for full details Beta-blockers can still be used with caution in the following (NICE 2025): • Elderly • COPD without reversibility • Peripheral vascular disease • Diabetes mellitus • Interstitial pulmonary disease • Erectile dysfunction
Prescribing	Initiation of Beta Blocker (GREEN) Prior to initiation: • Clinically stable heart failure (NYHA I-III) • If persisting signs of congestion/marked peripheral oedema, raised JVP, try to relieve congestion before initiating • Heart Rate >50bpm & no heart block on recent ECG • In AF, ventricular rates of <70 bpm are associated with worse outcomes (unless required for NSVT, ectopics etc.) • Systolic blood pressure >90mmHg • No Contraindications • Start with lowest recommended dose (dose can be split twice daily as up-titrated) • Up titration of dose as per dosing schedule <u>Patient Counselling</u> • Explain expected benefits to improve symptoms, prevent hospital admissions and increase survival. • Temporary deterioration may occur during admission or dose up titration. Encourage patients to weigh themselves daily and increase diuretics if needed <u>Bisoprolol Dose Schedule*</u> Start at 1.25mg daily, doubling the dose every 2 weeks to the target dose of 10mg or highest tolerated dose. <u>Carvedilol Dose Schedule*</u> If any concerns with low heart rate or severe LVSD consider using Carvedilol: Start at 3.125mg twice a day doubling the dose every 2 weeks to a target dose of 25mg twice daily or highest tolerated dose. If Weight >85kg and tolerating 25mg twice a day, consider increasing to 50mg twice a day > 2 weeks. <u>Nebivolol Dose Schedule*</u> Nebivolol can be considered if bisoprolol or carvedilol are not tolerated e.g. wheeze/bronchospasm: Start at 1.25mg daily doubling the dose every 2 weeks to a target dose of 10mg daily or highest tolerated dose. *Doses may be increased more rapidly under specialist monitoring or secondary care setting
Cautions	Beta- blockers should not be stopped suddenly unless absolutely necessary Aim to reduce dose or tail off slowly to zero if patient develops problems
Interactions	• If taking other rate reducing medication, consider reduction in dose (e.g. amiodarone, digoxin, ivabradine) • Do not use a combination of more than two rate limiting medications

Common side effects	Temporary deterioration may occur during admission or dose up titration. Encourage patients to weigh themselves daily and increase diuretics if needed.
Monitoring	• Monitor HR, BP and clinical status (signs and symptoms of HF especially signs of congestion and weight) • Check for adverse side-effects - Worsening heart failure - Consider adding or increasing dose of loop diuretic. If serious deterioration despite increased diuretics, halve the dose and seen specialist advice - Symptomatic hypotension – consider reduction of diuretic if no congestion. Consider reduction of other vasodilators e.g. calcium channel blockers, nitrates - Excessive bradycardia (<50 bpm) – Take ECG to exclude heart block. If taking other rate sparing medication, consider reduction in dose. Consider halving beta-blocker - Marked fatigue – reassure patient of likely improvement in symptoms. Review in 2 weeks. Consider switching to nebivolol and/or reducing the dose. If intolerant of Beta-Blocker • Consider reducing dose and review in 2 weeks. • Consider stopping and/or seek specialist advice

Appendix C:
Algorithm for the use of Mineralocorticoid Receptor Antagonist (MRA) (GREEN) in Chronic Heart Failure

<table>
<tr><td>Indications</td><td>

Recommend for all patients with HFrEF.
Consider for patients with HFmrEF and HFpEF
(see Stage 3 Management of Chronic Heart Failure for details on use of GDMT)

</td></tr>
<tr><td>Contra-indications</td><td>

Hyperkalaemia prior to initiation, i.e., serum potassium > 5mmol/l
Addisons disease.
Contraindicated if anuria. Caution if moderate renal impairment i.e., eGFR <30mls/min, but may be considered
Severe hepatic insufficiency

</td></tr>
<tr><td>Prescribing

Initiation & Titration</td><td>
Spironolactone (GREEN) is 1st line and should be prescribed as 25mg tablets:
For optimal clinical effectiveness, spironolactone should be dosed at 25mg daily. If a lower dose is required (symptomatic hypotension/hyperkalaemia/frailty), prescribe spironolactone 25mg on alternate days rather than 12.5mg tablets daily, for cost-effectiveness. Spironolactone 12.5mg tablets should only be prescribed if alternate day spironolactone cannot be tolerated (symptomatic hypotension/poor adherence).

Step 1: Assess whether suitable for treatment

All people with HFrEF
Consider for people with HFmrEF and HFpEF as per treatment confirmed algorithm
No evidence of hypovolaemia

Step 2: Check U+E and review use of potassium supplements and potassium-sparing diuretics

Potassium must be <5.0 mmol/l to initiate
Consider stopping potassium supplements and potassium sparing diuretics
Continue ACE inhibitor (or ARNI or ARB), ß-blocker, loop diuretics and digoxin if also prescribed

Step 3: Spironolactone initiation

Commence at 25mg daily
See monitoring and dose adjustment below
Increase to 50mg daily if persistent symptoms and no problems, e.g. hyperkalaemia

</td></tr>
<tr><td>Monitoring and dose adjustment</td><td>

Monitor U+E 1 week after initiation and after every dose increase, monthly for the first 3 months, then 3 monthly for the first year, and then 6 monthly.
Unstable patients (renal dysfunction, history of previous high K+) should have U+E 3 monthly
U+E should be rechecked if patients become unwell

<table>
<tr><td>Serum potassium (mmol/L)</td><td>Action</td><td>Dose adjustment</td><td>Repeat U+E
Minimum 6 monthly once stable</td></tr>
<tr><td>< 5.0</td><td>Increase</td><td>25mg every other day to 25mg daily
25mg daily to 50mg daily, repeat U+E after 1 week</td><td>1 week after a dose increase</td></tr>
<tr><td>5.0 – 5.4</td><td>Maintain</td><td>No dose adjustment</td><td>As a routine detailed above</td></tr>
<tr><td>5.5 – 5.9</td><td>Decrease</td><td>50mg daily to 25mg daily
25mg daily to 25mg every other day
25mg every other day to withhold</td><td rowspan="2">After 5-7 days</td></tr>
<tr><td>≥ 6.0</td><td>Withhold</td><td>N/A. *Consider referral to heart failure specialist team to assess suitability for potassium binders.</td></tr>
</table>
</td></tr>
<tr><td>Common side effects</td><td>

Hyperkalaemia, actions detailed above
Gastro-Intestinal Disturbance, Diarrhoea – Stop aldosterone antagonist and repeat U&Es at earliest convenience
Gynaecomastia, if intolerable consider eplerenone

</td></tr>
<tr><td>Eplerenone (GREEN)</td><td>

Indicated 3-14 days post-MI with HFrEF≤40% NYHA I-II
Chronic heart failure NYHA Class II and HFrEF≤40%
Intolerable Gynaecomastia on spironolactone
Start at 25mg and aim to titrate dose up to 50mg daily as tolerated
Monitor K+ as per spironolactone table above
Eplerenone cannot be dosed at 12.5mg, give 25mg every other day

</td></tr>
</table>

Appendix D: Algorithm for the use of Ivabradine in HFrEF (AI)

Indications (as per NICE TA267)	For inadequate Heart Rate Control, i.e., HR≥75bpm for patients with HFrEF in sinus rhythm maximised on beta blocker, if • HFrEF **and** resting HR≥75 **and** NYHA II-IV • Only initiate after a stabilisation period of 4 weeks on optimised GDMT (see stage Table 1) • Do NOT start ivabradine instead of a beta blocker unless beta blocker is contra-indicated • DO NOT use in atrial arrhythmias (e.g. AF) as there is no effect • Initiation should be by a HF specialist prescriber with access to a multidisciplinary team.
Contra-indications	• Resting HR <60bpm prior to treatment • Cardiogenic shock • Acute myocardial infarction • Severe hypotension (<90/50mmHg) • Severe hepatic insufficiency • Sick sinus syndrome • Sino-atrial block • Unstable or acute heart failure • Pacemaker dependent (HR imposed exclusively by the pacemaker) • Unstable angina • AV-block of 3rd degree • Combination of strong cytochrome P450 3A4 inhibitors e.g. ketoconazole, clarithromycin, erythromycin, see SPC for full details • Pregnancy, lactation
Prescribing	Ivabradine (AI) dosing: • 5mg twice daily • Titrate after 2 weeks of treatment to 7.5mg twice daily if resting HR persistently >60 bpm • If HR is between 50 – 60 bpm – continue 5mg twice daily • Do not use a combination of more than two rate limiting medications Elderly patients (≥75 years) • Start at 2.5mg twice daily • Titrate after 2 weeks if resting HR persistently >60 bpm to 5mg twice daily (then as per above) • If HR is between 50 – 60 bpm – continue 2.5mg twice daily During treatment, if HR decreases persistently <50 bpm at rest or the patient experiences symptoms related to bradycardia, the dose must be titrated down to the next lower dose. Treatment must be stopped if HR remains <50 bpm or symptoms of bradycardia.
Cautions	• Consider stopping treatment if unexpected deterioration in visual function (see note below on phosphenes) • There is limited data to support use in NYHA class 4 • Patients with congenital QT syndrome or combined with drugs that prolong the QT • Chronic HF patients with intraventricular conduction defects (LBBB, RBBB, ventricular dyssynchrony) – monitor closely • Use cautiously if eGFR / CrCl <15mls/min • Do not use more than two rate limiting medications
Interactions	• Diltiazem or verapamil – not recommended • Grapefruit juice – restrict intake • CYP3A4 inducers e.g. rifampicin, St John's wort, barbiturates and phenytoin
Common side effects	• Luminous phenomenon (phosphenes) • Headache and dizziness • Bradycardia
Monitoring	• Check at least annually for AF development and confirm on ECG. If AF occurs, stop treatment. • Dose titration and monitoring should be carried out by a heart failure specialist or in primary care by a prescribing clinician with a special interest in heart failure. • If remains symptomatic on a beta-blocker and ivabradine in sinus rhythm consider switching ivabradine to digoxin (avoid triple therapy). • Once patients are stable on a maintenance dose, care may be transferred back to primary care.

Appendix E: Algorithm for the use of SGLT2 inhibitors in Heart Failure (AR)

<table>
<tr><td>Indications</td><td>Confirmed Heart Failure across the LVEF spectrum
• Start dapagliflozin 1st line in patients with heart failure (HF) irrespective of ejection fraction
• Empagliflozin may be considered in patients who have previously not tolerated dapagliflozin (unless genitourinary infections, hypoglycaemia, dehydration and hypotension which carries a similar risk)</td></tr>
<tr><td>Contra-indications</td><td>Contraindications
• Allergy to SGLT2 inhibitors
• Type 1 diabetes
• Pregnancy and breastfeeding
Should not use if:
• Previous diabetic ketoacidosis (DKA)
• High risk of DKA e.g. previous pancreatitis, starvation – see SPC for full details: dapagliflozin / empagliflozin.
• Dapagliflozin is licensed for eGFR ≥15ml/ min but limited experience in eGFR <25 ml/min
• Empagliflozin is licensed for eGFR ≥20ml/ min</td></tr>
<tr><td>Cautions</td><td>• Previous urosepsis / recurrent genitourinary tracts infections
• Recurrent hypoglycaemia
• Peripheral vascular disease especially if previous amputation or foot ulcer – seek advice from vascular specialist
• Raised haematocrit
• Severe liver impairment
• Hypotension (SBP <95 mmHg)
• Elderly patients may be at increased risk of volume depletion</td></tr>
<tr><td>Prescribing</td><td>Provide Patient Information – responsibility of initiating clinician
Provide a patient information leaflet specific for heart failure indication: dapagliflozin (patients without type 2 diabetes) / dapagliflozin (patients with type 2 diabetes) / empagliflozin. This may have been supplied by the heart failure team, but it is the responsibility of the prescribing clinician to ensure the patient has received and understands this. Explain expected benefits; to improve QOL, reduce the risk of hospital admission for heart failure and increase survival.

Sick day rules for dapagliflozin / empagliflozin: Stop during acute illness especially if too unwell to eat and drink. Stop 3 days prior to major surgery. Restart when fully recovered and eating and drinking normally.

Ketoacidosis: For patients with or without type 2 diabetes mellitus (T2DM), provide education on signs and symptoms of ketoacidosis. Importance of seeking medical help if any signs of ketoacidosis or feeling unwell and the need to be tested for blood ketones (by healthcare staff) even if blood glucose is near normal. Ketoacidosis is less likely to occur in patients without diabetes.

Important side effects (not prescriptive – see individual SPCs for dapagliflozin / empagliflozin for full details including frequency):
• Hypoglycaemia when used in combination with insulin or sulfonylureas
• Increased urination and dehydration
• Genital and urinary tract infections
• Allergic reactions including rash / urticaria / angioedema
• Transient rise in creatinine during initial treatment (up to 20%).
• Risk of ketoacidosis, particularly in patient with diabetes - discontinue immediately and DO NOT restart
• Fournier's gangrene (discontinue and initiate treatment promptly)</td></tr>
<tr><td>Initiation & Titration</td><td>• Check baseline bloods: U&Es including eGFR, FBC, LFTs and HbA1c - responsibility of initiating clinician
• It is the responsibility of the specialist clinician making the decision or recommendation to prescribe an SGLT2- inhibitor, to assess the patient's suitability for treatment and to clearly document the outcome of the shared decision-making conversation and informed patient consent. This should be clearly communicated to the patient's primary care prescriber, using the GP communication letter and should include confirmation that appropriate counselling has been provided, to enable them to safely initiate or continue prescribing.

<table>
<tr><th colspan="2">Assess fluid status and addition of SGLT-2 Inhibitors to diuretic therapy</th></tr>
<tr><th>Volume status</th><th>Changes to existing therapy</th></tr>
<tr><td>Euvolemic patients</td><td>Review loop diuretic dose</td></tr>
<tr><td>Volume overload</td><td>Add SGLT2 inhibitor to existing diuretics and review diuretic plan</td></tr>
<tr><td>Hypovolaemia</td><td>Correct volume depletion before adding SGLT2 inhibitor</td></tr>
<tr><td>Thiazide diuretic for hypertension</td><td>Discontinue thiazide and start SGLT2i. GP to review BP in 4-6 weeks. Preference should be to up-titrate ACEi/ARB/ARNI, beta blocker and MRA.</td></tr>
<tr><td>Thiazide in combination with a loop diuretic for fluid overload</td><td>Discuss with cardiologist</td></tr>
<tr><td colspan="2">If in doubt, seek advice from patient's heart failure specialist</td></tr>
</table>
</td></tr>
</table>

- If patients have Type 2 Diabetes review HBA1c as per the table below:

Criteria	Advice	Diabetes Review
HbA1c <41 (tight control) *or* > 2 agents	Assess risk of hypoglycaemia	Review diabetes regimen/consider if dose reduction of other oral hypoglycaemics is needed
on sulphonylureas* or insulin	High risk of hypoglycaemia	Review and consider dose reduction of sulphonylurea* / insulin before adding SGLT2 i
HbA1c 41-58 *and* on ≤ 2 antidiabetic agents (except sulphonylureas/ insulin)	Add SGLT2 inhibitor to existing therapy	No additional requirements. Consider reviewing diabetes regime if good diabetic control is not achieved after 3 months.
HbA1c 58-78	Add SGLT2 inhibitor to existing therapy ensuring compliance with NICE diabetes recommendations.	Review diabetes regimen as per NICE Diabetes recommendations, due to poor control and/or refer for specialist diabetes advice for poor or very poor control to consider injectable therapy assessment.
HbA1c >78	Withold SGLT2i until HBA1c <78	Review diabetes regimen as per NICE Diabetes recommendations, due to poor control and/or refer for specialist diabetes advice for poor or very poor control to consider injectable therapy assessment.
NB: If eGFR <45ml/min there may be little effect on diabetic control, dose reductions may not be needed		
If in doubt, seek advice from a diabetes specialist *Sulphonylureas e.g. gliclazide, glipizide, tolbutamide		

- Patients with no diabetes Commence dapagliflozin 10mg daily as 1st line, or empagliflozin 10mg daily, if dapagliflozin not previously tolerated, noting similar risks for genitourinary infections, hypoglycaemia, dehydration and hypotension.
- For use in severe liver impairment, start dapagliflozin at 5mg daily, increasing to 10mg daily if tolerated – discuss with heart failure specialist. Do not use empagliflozin in severe liver impairment
- Document indication for SGLT2 inhibitor clearly to prevent confusion when considering diabetes or prediabetes risk.

Abbreviations

ACBS	Anticholinergic burden score	HFmrEF	Heart Failure with mildly reduced ejection fraction (≤ 41-49%)
ACEi	Angiotensin-Converting Enzyme Inhibitor	HFpEF	Heart Failure with preserved ejection fraction (≤ 50%)
AI	Amber initiated	HF MDT	Heart failure multidisciplinary team
AF	Atrial fibrillation	HR	Heart rate
AKI	Acute kidney injury	ICD	Implantable Cardioverter Defibrillator
AR	Amber recommended	JVP	Jugular venous pressure
ARB	Angiotensin receptor blocker	LBBB	Left bundle branch block
ARNI	Angiotensin Receptor-Neprilysin Inhibitor	LVEF	Left ventricular ejection fraction
ASCVD	Atherosclerotic cardiovascular disease	MECC	Make every contact count
BB	Beta-blocker	MRA	Mineralocorticoid receptor agonist
CKD	Chronic kidney disease	NSAID	Non-steroid anti-inflammatory drug
COPD	Chronic obstructive pulmonary disease	NT pro-BNP	Key biomarker blood test for diagnosis of heart failure
CRT-P & CRT-D	Cardiac Resynchronisation Therapy Pacemaker, with pacemaker only (CRT-P), with defibrillator (CRT-D)	NYHA	New York heart association
DM	Diabetes mellitus	PND	Paroxysmal nocturnal dyspnoea
DCCV	Direct current cardio-version	QRS	ECG finding detailing the duration of the QRS interval when considering CRT therapy
DVLA	Driver and vehicle licensing agency	RBBB	Right bundle branch block
ECG	Electrocardiogram	SC/IV	Subcutaneous/intravenous
EF	Ejection fraction	SGLT2i	Sodium-Glucose Co-transporter 2 inhibitor
GDMT	Guideline directed medical therapy	SR	Sinus rhythm
HB	Haemoglobin	STRONG-HF	Safety, tolerability and efficacy of up-titration of guideline-directed medical therapies for acute heart failure
HF	Heart Failure	TIA	Transient ischaemic attack
HFrEF	Heart Failure with reduced ejection fraction (EF≤ 40%)	VR	Ventricular rate

Linked documents for consideration to replace, amend or archive:

Sacubitril/Valsartan	
Link to existing document	Comment: Amend/Archive/Keep
Legacy Cheshire Heart Failure Guidelines - March 2021	Archived.
Legacy Merseyside (2020): Sacubitril/Valsartan film-coated tablets (Entresto®▼) STATIC	Archived
NICE TA388: Sacubitril valsartan for treating symptomatic chronic heart failure with reduced ejection fraction	Link NICE NG106 instead
North West Strategic Clinical Network (2020): GP communication letter	Archived
North West Strategic Clinical Network (2020): Sacubitril/Valsartan (Entresto®) treatment algorithm	Archived
North West Strategic Clinical Network (2016): Patient Information leaflet (prior to starting Sacubitril/Valsartan (Entresto®)	Keep. For updating
North West Strategic Clinical Network (2020): Statement on the use of Sacubitril/Valsartan (Entresto ®) for the treatment of symptomatic chronic heart failure with reduced ejection fraction	Archived
SGLT2 inhibitors	
Cheshire and Merseyside APG (2024): DAPAGLIFLOZIN and EMPAGLIFLOZIN for chronic heart failure: a multiple prescribing statement v1.0	tbc
Cheshire and Merseyside APG (2024): DAPAGLIFLOZIN and EMPAGLIFLOZIN for chronic heart failure: GP letter v1.0	Under review
Cheshire and Merseyside APG (2024) SGLT2 inhibitors in heart failure heart failure pathway v1.0	tbc
Legacy Cheshire APG (2021). Heart Failure Guidelines	Archived
NICE (2021). Dapagliflozin for treating chronic heart failure with reduced ejection fraction	Keep
NICE (2023). Dapagliflozin for treating chronic heart failure with preserved or mildly reduced ejection fraction	Keep
NICE (2022). Empagliflozin for treating chronic heart failure with reduced ejection fraction	Keep
NICE (2023).Empagliflozin for treating chronic heart failure with preserved or mildly reduced ejection fraction	Keep

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