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UCLPartners Proactive Care Framework:

Heart Failure

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Abbreviations

ARB: Angiotensin receptor blocker
ARRS: Additional roles reimbursement scheme
ACEi: Angiotensin II converting enzyme inhibitor
ARNI: Angiotensin receptor neprilysin inhibitor
BB: Beta blocker
BP: Blood pressure
CKD: Chronic kidney disease
EF: Ejection fraction
ECG: Electrocardiogram
HF: Heart Failure
HFmrEF: Heart failure with mildly reduced ejection fraction
HFpEF: Heart failure with preserved ejection fraction
HFrEF: Heart failure with reduced ejection fraction
MRA: Mineralocorticoid receptor antagonist
NT-proBNP: N-terminal pro B-type natriuretic peptide
SGLT2i: Sodium-glucose co-transporter-2 inhibitors

Why focus on Heart Failure?

Around **600,000** people in the UK have diagnosed heart failure (HF) with **60,000 new cases annually**. A further 300,000 are undiagnosed. HF symptoms are often not specific and therefore there are delays in making a diagnosis.

Heart failure is associated with **significant mortality and morbidity**. It is:

- associated with approximately 20% mortality at one year
- the most common cause of admission in those over 65 years
- associated with an **extended length of hospital** stay and **a 30% risk of readmission** within 3 months

Diuretic therapy significantly improves the **quality of life** for patients with heart failure.

Mortality and morbidity in patients with heart failure with reduced ejection fraction (HFrEF) can be **significantly reduced** with optimisation of therapy – ACEi / ARB / ARNI + BB + MRA + SGLT2i reduce mortality by over **60% . SGLT2i also improve prognosis** in patients with HFpEF / HFmREF

In patients with HF other co-morbidities and cardiac risk factors are common and should be managed to reduce overall cardiovascular risk

The Challenge of Long-Term Condition Management in Primary Care

Historical challenge in long term condition care

- Late diagnosis, suboptimal treatment, unwarranted variation
- Lack of self-management support
- Holistic care not always provided

Real World Primary Care:

- Complexity, multimorbidity and time pressures
- Soaring demand and shifting priorities
- Winter pressures

Pandemic impact:

- Disruption of routine care in long term conditions
- Risk of poorer outcomes for patients and health inequalities
- An increase in health care demand

UCLPartners Proactive Care Frameworks address core challenges in primary care

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Aim

Help people with long term conditions to stay well longer

Objectives

1. Mobilise data - Identify patients whose care needs optimising and prioritise those at highest risk
2. Harness wider workforce – standardise delivery of holistic proactive care by wider primary care team
3. Support GPs to safely manage workflow, improve care and outcomes and release capacity

Heart Failure (HF) Framework components

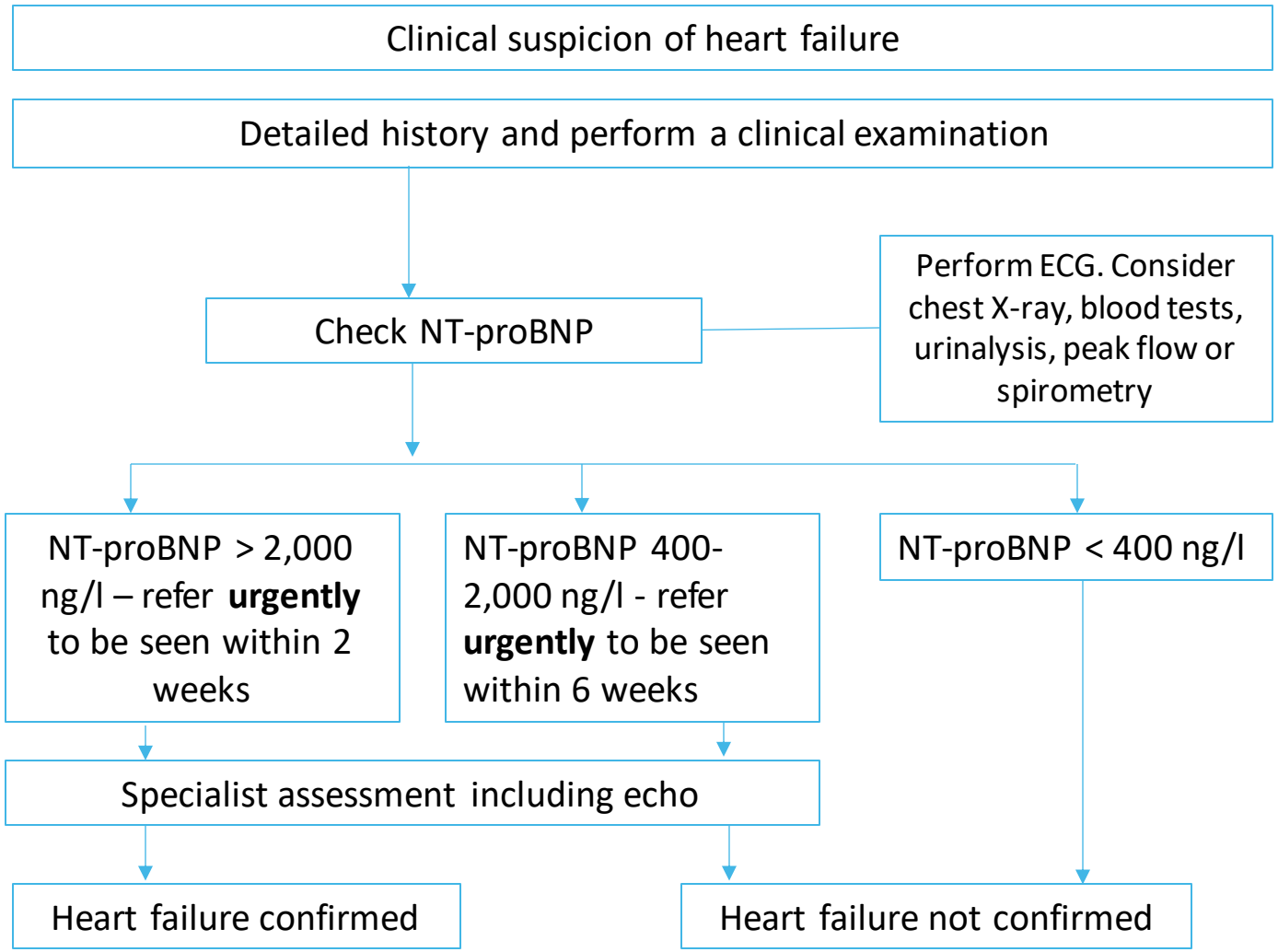
- ✓ Desktop review of HF patients to confirm diagnosis and ensure appropriate coding
- ✓ Locally adaptable resources to support real world management and embed 6 monthly reviews
- ✓ Systematic use of wider primary care team (eg ARRS* roles)
  - Structured support for education, self-management and behaviour change

Framework Development

1. Led by primary care clinicians
2. Based on NICE guidelines and clinical consensus
3. Patient and public support

*Additional Roles Reimbursement Scheme

Diagnosing heart failure



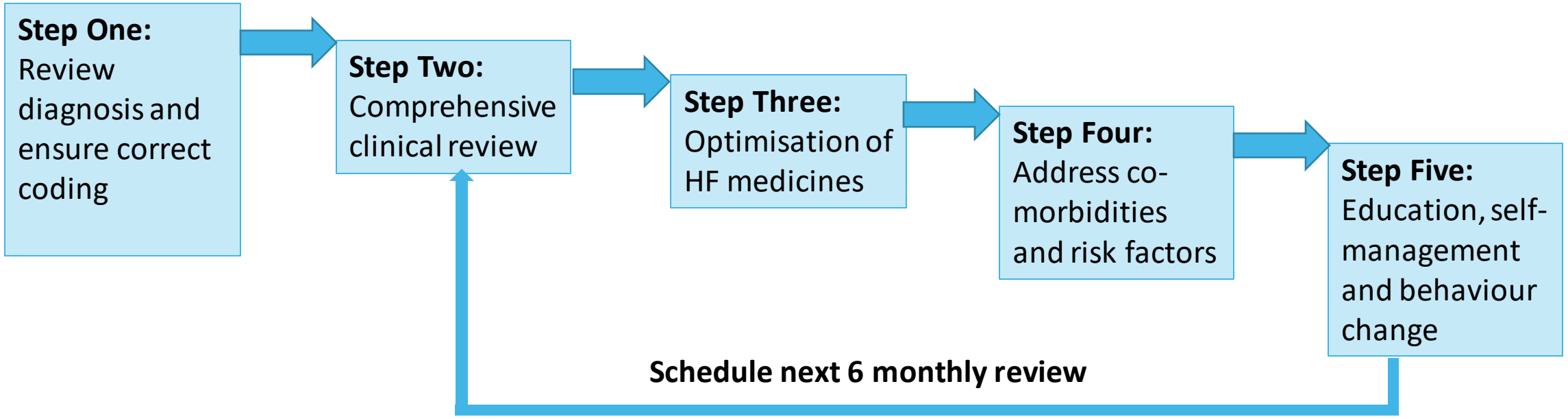
Typical signs and symptoms of heart failure:	Other symptoms where HF should be considered
• Breathlessness – new onset or worsening • Fatigue • Swelling of ankles / legs	• Paroxysmal nocturnal dyspnoea or orthopnoea • Dizziness and syncope • Persistent cough, which may be worse at night • Wheezing • Abdominal bloating • Loss of appetite • Weight gain or weight loss • Confusion • Fast heart rate • Pounding, fluttering or irregular heartbeat (palpitations)

Reference:
Overview | Chronic heart failure in adults: diagnosis and management | Guidance | NICE

A stepwise approach to optimising HF care

Aim: To embed proactive care for HF patients into routine clinical practice

- NICE recommends patients with HF are reviewed **at least once every 6 months**
- Risk stratification searches are unlikely to identify HF patients at greatest risk – with relatively small numbers of HF patients at practice level this proactive care Framework focuses on ensuring HF patients have been coded in line with their HF diagnosis and embedding 6 monthly reviews for all HF patients.



Heart Failure: The Proactive Care Framework

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ARRS* Roles

Gather information Up to date bloods, BP, pulse rate and rhythm, recent ECG, weight, smoking status, symptoms

Self-management Education (heart failure signs and symptoms, daily weights and signpost to educational resources

Behaviour change Brief interventions and signposting e.g., smoking, weight, diet, exercise, alcohol.

Stratification & Prioritisation (Desktop Review)

Heart failure with reduced ejection fraction (HFrEF)	Heart failure with mildly reduced ejection fraction (HFmrEF)	Heart failure with preserved ejection fraction (HFpEF)

Prioritise :
- New diagnosis in last 6 months
- Admission to hospital in last 6 months
- Prognostic medication not optimised
- HF diagnosis with complex co-morbidities

Prescribing clinician

Optimise therapy and CVD risk reduction

1. Review: bloods and other results
2. Assess symptoms and adjust diuretics as required
3. Initiate and / or optimise prognostic medications (For HFrEF - ACEI / ARB / ARNI, BB, MRA; SGLT2i in all types of HF)
4. Check adherence and review any side effects.
5. Optimise BP and lipid management to reduce cardiovascular risk.
6. Review pulse rate and rhythm and manage as needed.

*Additional Roles Reimbursement Scheme

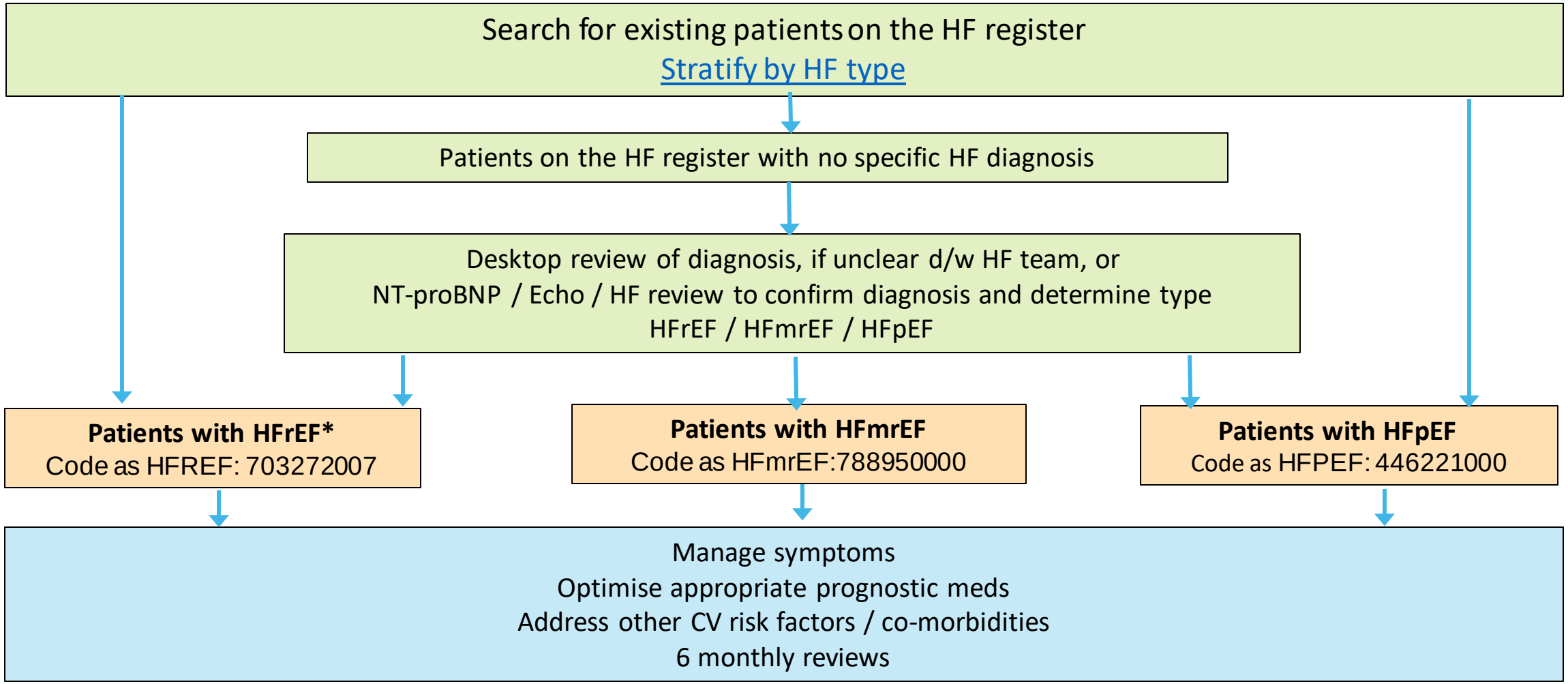
Definition and Types of Heart Failure: HFrEF, HFmrEF and HFpEF

Heart failure is a complex clinical syndrome that results from a functional or structural disorder of the heart, impairing ventricular filling or ejection of blood to the systemic circulation. It is by definition a failure to meet the systemic demands of circulation.

Type of HF	HFrEF	HFmrEF	HFpEF
Signs and symptoms of heart failure	Present	Present	Present
NT-proBNP	Raised	Raised	Raised
Echo findings	EF ≤ 40%	EF 41-49%	EF ≥ 50% with structural heart disease (e.g. LVH or left atrial dilatation) and / or diastolic dysfunction
Management	Symptom control, lifestyle, prognostic medicines – ACEI / ARB / ARNI, BB, MRA, SGLT2i, optimise CV risk factors	Symptom control, lifestyle, prognostic medicines – SGLT2i, optimise CV risk factors. (As new data emerges many specialist HF services are now considering ACEI / ARB / ARNI, BB, MRA in HFmrEF)	Symptom control, lifestyle, prognostic medicines – SGLT2i, optimise CV risk factors. HF specialists may consider MRAs in HFpEF

HF: heart failure.
HFrEF: heart failure with reduced ejection fraction.
HFmrEF: heart failure with mildly reduced ejection fraction.
HFpEF: heart failure with preserved ejection fraction.
EF: ejection fraction.
NT-proBNP: N-terminal pro B-type natriuretic peptide.

Summary of desktop review



*Patients with an original HFrEF diagnosis with an improved ejection fraction - i.e more recent ECHO with EF>40% due to medical optimisation should still be coded and treated as HFrEF as per initial diagnosis

Detail of Desktop Review

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Checking the diagnosis and prioritisation

1. Go to the practice Heart Failure register
2. Work through the list by individual patient
3. Check patient problem list: Is there reference to heart failure (e.g. congestive heart failure, cardiomyopathy or LVSD)
4. Check date the problem was coded and cross check in communication & letters: Is there a letter or an ECHO result?
5. If Echo or letter, check ejection fraction (EF) % and other information from HF team
6. Code the patient appropriately
    1. HFrEF (HF with EF≤40%)* Snomed: 703272007
    2. HFmrEF (HF with EF 41-49%) Snomed: 788950000
    3. HFpEF (HF with EF>50%) Snomed: 446221000
7. If HF diagnosis not clear – seek advice from local HF team (acute trust or community). If no record of HF diagnosis repeat NT-pro BNP and / or ECHO to confirm the diagnosis and code accordingly

Guidance on the diagnosis of HF can be found in: NICE NG106

Prioritise for early review:

Patients with HF requiring earlier review:

1. Patients hospitalised for HF within last 6 months
2. Patients newly diagnosed with HF in last 6 months
3. Patients not on optimised on prognostic medicines
4. HF patients with additional co-morbidities (eg CKD, diabetes, COPD)

NICE recommends all patients with HF are reviewed at least 6 monthly

*Patients with an original HFrEF diagnosis with an improved ejection fraction - i.e more recent ECHO with EF>40% due to optimisation should still be considered HFrEF as per original diagnosis and must remain on their prognostic medications

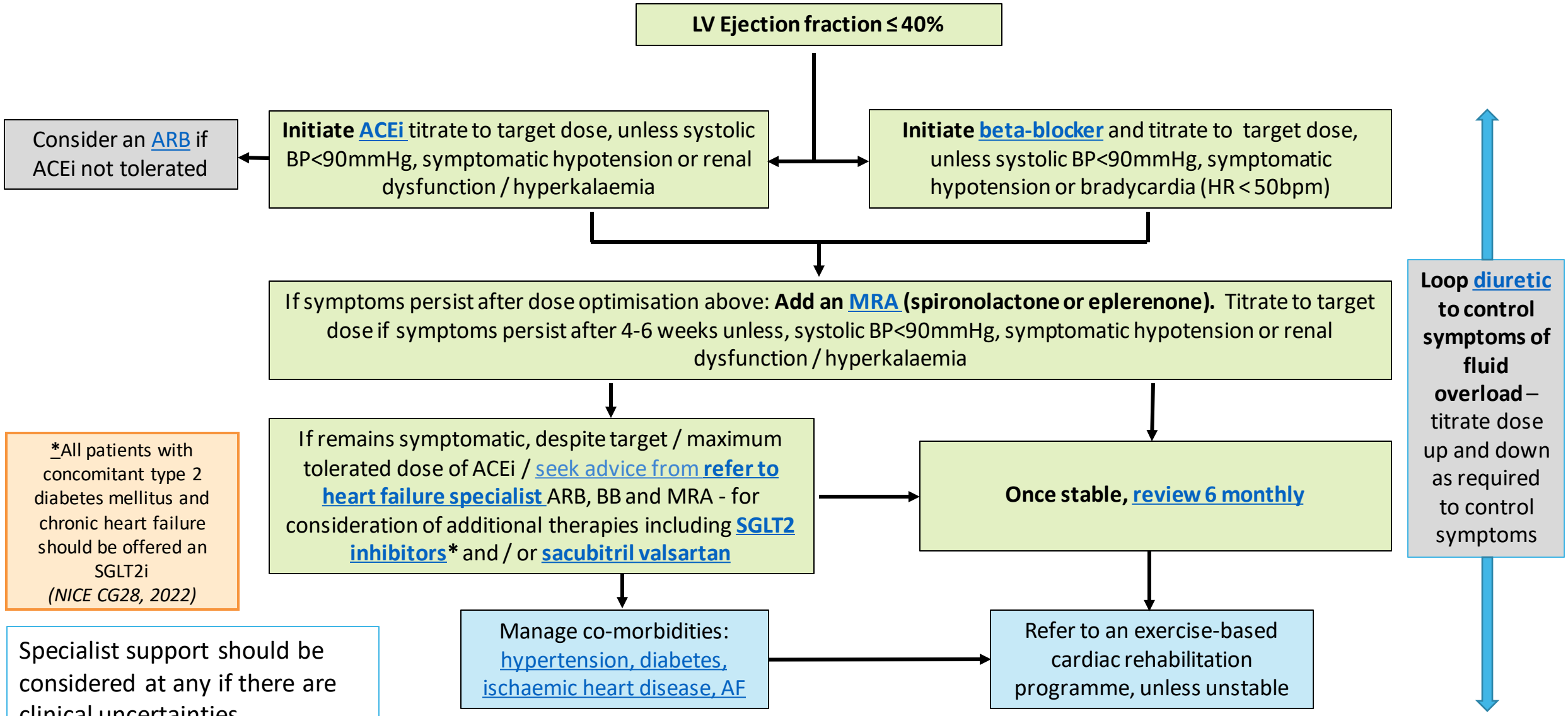
Heart Failure: the clinical review

Patients should be reviewed as clinically indicated but at least once every six months

	Action	Detail
1	Check the type of heart failure the patient has	HFpEF, HFmrEF or HFrEF – this will determine treatment options*
2	Undertake a comprehensive clinical review	To include functional capacity, fluid status, cardiac rhythm (minimum of examining the pulse), frailty, cognitive status and nutritional status, mental health and wellbeing
3	Check and review bloods:	Including renal function, potassium, and sodium levels and LFTs. Consider HbA1c, thyroid function , FBC and serum ferritin
4	Review medication • Titrate doses • Initiate/optimise prognostic medications • Identify and address adverse effects	• Adjust diuretic dose sufficient to control symptoms and minimise adverse effects • For HFrEF: Initiate and titrate to maximum tolerated/optimal dose of ACEI / ARB / ARNI and BB. If symptoms continue - add MRA. Consider SGLT2i for all types of HF • If Type II Diabetes Mellitus – review drugs to control, blood glucose and consider addition of or switch to SGLT2 inhibitor
5	Address other CV risk factors	Identify and manage AF, high blood pressure, lipids and raised blood glucose, where appropriate
6	Provide appropriate education and support for self-management and behaviour change	For example: daily weights, diuretic self-management, lifestyle factors, home BP, digital tools
7	Consider referral for specialist HF review	In line with guidance on 'when to refer'
8	Schedule for next 6 monthly review	Or earlier review if clinically indicated

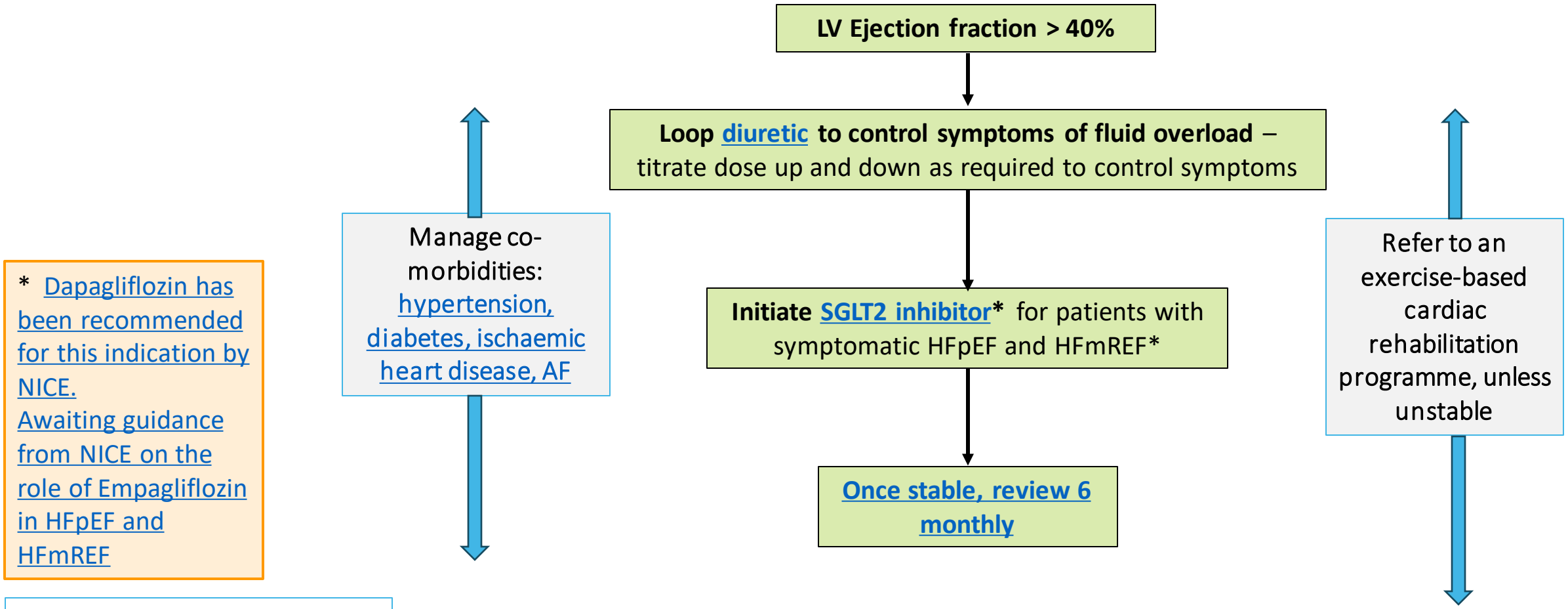
**Patients with an original HFrEF diagnosis with an improved ejection fraction - i.e more recent ECHO with EF>40% due to optimisation should still be considered HFrEF as per original diagnosis and must remain on their prognostic medications

Managing HFrEF



 Based on: https://www.nice.org.uk/guidance/ng106/resources/chronic-heart-failure-management-visual-summary-pdf-6663137725

Managing HFpEF / HFmrEF



Based on: https://www.nice.org.uk/guidance/ng106/resources/chronic-heart-failure-management-visual-summary-pdf-6663137725

Managing Cardiovascular Comorbidities – specific drug indications

Co-morbidity	Management
Hypertension	• Optimise prognostic medicines and then consider adding amlodipine if BP remains poorly controlled
Atrial fibrillation	• Offer anticoagulation if $CHA_2DS_2VASc \geq 2$ (consider in men if CHA2DS2VASc = 1) • Control resting heart rate to 90-100bpm (aim of a lower heart rate if persistent symptoms or cardiac dysfunction likely related to tachycardia)
Diabetes	• Consider offering SGLT2i, if not already prescribed
Ischaemic heart disease	• Offer aspirin • Offer maximal statin therapy and intensify with additional therapies as needed • Ensure angina is well controlled with one or two oral anti-anginal therapies (beta-blocker first-line +/- amlodipine) – if remains symptomatic refer for cardiology review

NYHA Class = New York Heart Association Classification

No symptoms, can perform ordinary activities without any limitation

Mild symptoms, occasional swelling. Somewhat limited ability to exercise or do other strenuous activities. No symptoms at rest

Noticeable limitations in ability to exercise or participate in mildly strenuous activities. Comfortable only at rest.

Unable to do any physical activity without discomfort. Symptoms at rest.

https://www.researchgate.net/figure/New-York-Heart-Association-NYHA-Heart-Failure-Symptom-Classification-System_fig1_303031519

When to seek specialist help

- Heart failure is a chronic long-term condition with periods of decompensation requiring advanced support and referral to secondary care for specialist management.
- The therapeutic goals of heart failure therapy is to control symptoms and maximise prognostic therapies.

6 monthly reviews* within primary care	Refer for HF review	Urgent HF Specialist review
Patient stable without no or minimal symptoms and optimised on prognostic meds (noting individual baselines functional ability will differ)	Patient symptomatic (NYHA II/III) and on optimal dose ACEi / ARB / ARNI, BB, MRA, SGLT2i – refer for consideration of specialist therapy	Patient symptomatic (NYHA IV) Significant increase in SOB Significant increase in fatigue Chest pain Syncope
	Patients with the following signs / symptoms – weight gain, increased SOB, increased fluid retention, increased fatigue and/or new cough, - increased dose of diuretics but symptoms not resolved within 2 weeks	

*Virtual reviews, including assessing blood results, may be considered in patients with minimal symptoms (NYHA class I)

Summary of Medicines Monitoring

	What to check	At baseline	Up to two weeks after initiation or up titration	Once target / max tolerated dose achieved		
				Monthly for 3 months then at least 6 monthly thereafter	At least 6 monthly thereafter	At least annually thereafter
ACEi / ARB /ARNI	Renal profile Blood pressure Side effects	✓	✓		✓	
MRA	Renal profile Blood pressure Side effects	✓	✓	✓		
Diuretics	Renal profile Blood pressure Side effects	✓	✓		✓	
Beta-blockers	Blood pressure Heart rate Side effects	✓	✓		✓	
SGLT2i	Renal function Blood pressure HbA1c (If diabetic) Side effects	✓	✓			✓

Proactive Care Consultations

Members of the wider primary care team (e.g. ARRS* roles such as health care assistants and care coordinators) can provide structured support for education, self-management and behaviour change, sharing trusted information from charity and other websites. The UCLPartners Proactive Care Frameworks include education and training resources to support these consultations and educational digital resources to share with patients.

Education e.g.

- What is heart failure, daily weights, high blood pressure, cholesterol

Self-management e.g.

- Daily weights
- How to check your blood pressure at home
- How to choose a blood pressure monitor
- When to seek advice

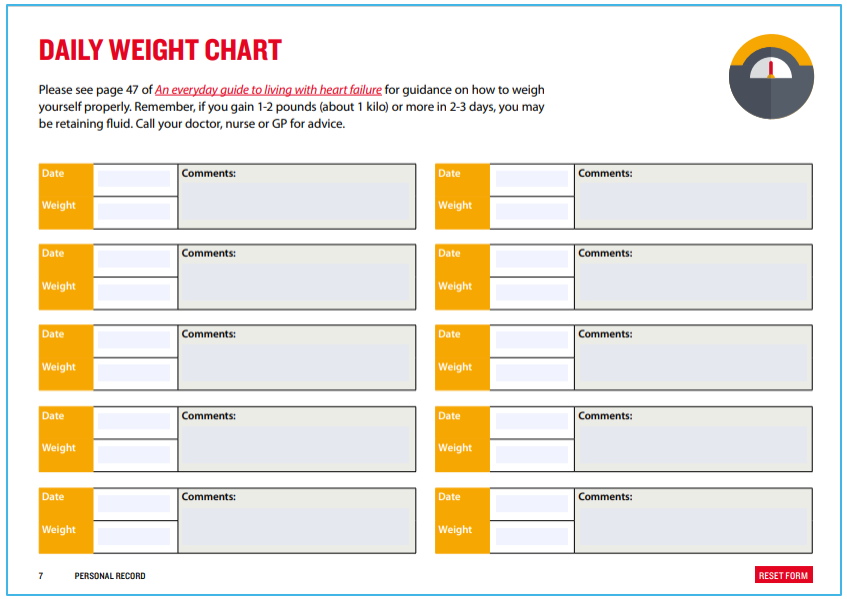
Behaviour Change – brief interventions and signposting.

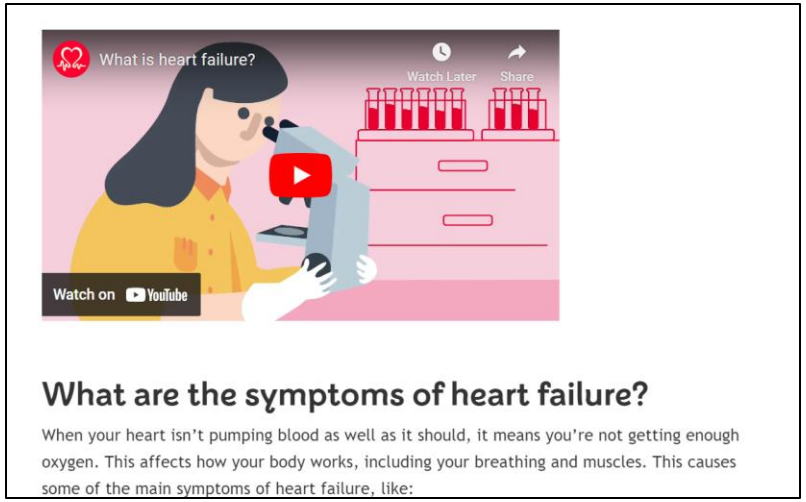
- Healthy eating
- Physical activity
- Smoking cessation
- Alcohol

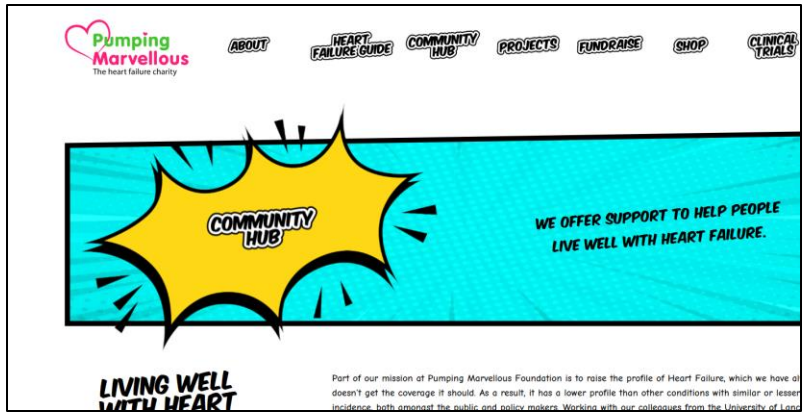
*Additional Roles Reimbursement Scheme

Heart Failure resources for Patients and Staff

- BHF Heart Failure
- BHF Heart Failure Personal Record
- Pumping Marvellous Heart Failure Guide
- Pumping Marvellous Living well with Heart Failure
- NHS Heart Failure information
- Medicines for my Heart







Additional Resources for Patients and Staff

Education

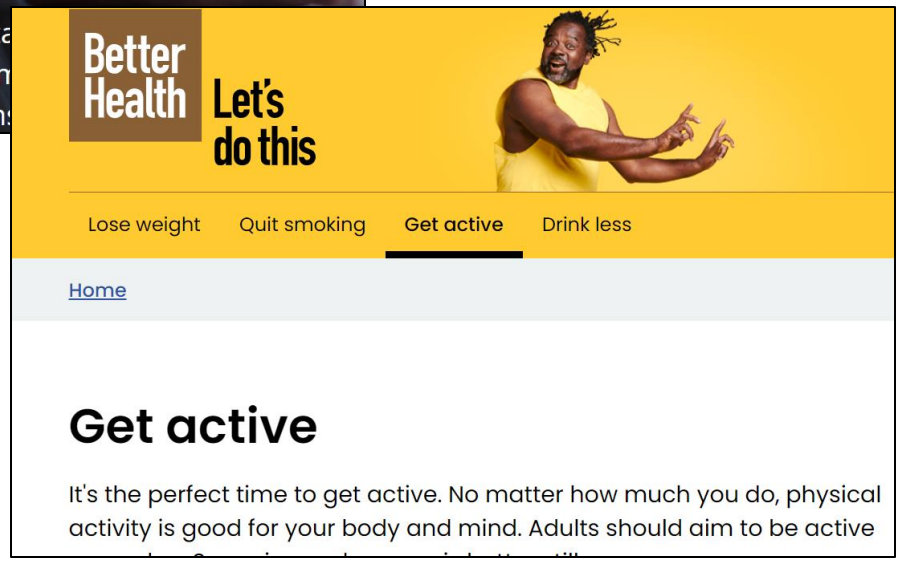
[Understanding high blood pressure]
[What is high blood pressure?]
[Risk factors for heart and circulatory disease]
[Understanding cholesterol]
[How to lower your cholesterol]

Self-management

[How to reduce your blood pressure: 6 top tips]
[Manage your blood pressure at home]
[Home Blood Pressure Monitoring (video)]
[How to choose a blood pressure monitor]
[How to check your blood pressure (video)]

Behaviour Change

[Eat well]
[Healthy eating guide]
[Get active]
[Get active indoors]
[Ways to move]
[Quit smoking]
[Drink Less]



Proactive Care Consultations Guide

The education and training resources can be accessed here or by using the QR code below:

Diuretics in heart failure

Diuretics

- Used to reduce signs and symptoms of congestion and fluid retention
- Loop diuretics produce more intense and shorter diuresis than thiazides. Doses adjusted to maintain euvolaemia – often patients require on-going low to medium dose of diuretic i.e. less than 80mg furosemide daily
- Combinations of loop and thiazide diuretics may be used to treat resistant oedema – caution as adverse events more likely, in particular electrolyte deficiency and risk of hypovolemia (see under monitoring)
- Loop and thiazide diuretic combination only under specialist input.

Loop Diuretics	Initial dose	Usual daily dose*
Furosemide	20-40mg daily	40 - 240mg daily
Bumetanide	0.5-1mg daily	1 - 5mg daily

*doses above furosemide 80mg or equivalent may require split dosing with second dose no later than 2pm i.e. 120mg furosemide given as 80mg at 9am and 40mg at 2pm.

Consider bumetanide if unresponsive to oral frusemide. 1mg bumetanide = 40mg frusemide.

Thiazide Diuretics	Initial dose	Usual daily dose
Bendroflumethiazide	2.5mg alternate days	2.5 to 5mg daily
Metolazone* (specialist initiation)	2.5mg once or twice weekly	2.5 to 5mg on alternate days

NOTE: if on thiazide and concomitant loop diuretics - ensure close monitored for signs of excessive diuresis and decline in renal function - suggest as a minimum 4 weekly review, more frequently if clinically indicated

Note difference in bioavailability between metolazone brands. - https://www.sps.nhs.uk/articles/differences-between-metolazone-preparations-and-safety-considerations/

Monitoring:

Fluid status

- Can monitor response through reduction in body weight – aiming for 0.5 to 1kg loss per day – caution to avoid over diuresis
- Do not routinely ask patients to restrict fluid
- Some patients may be suitable to alter their own diuretic doses according to need

Blood pressure

- Symptomatic or severe asymptomatic hypotension (systolic blood pressure <90mmHg) – may be made worse by diuretic induced hypovolaemia

Renal function

- Significant renal dysfunction (creatinine>221umol/L or eGFR <30min/min) – made worse by diuretic or patient may not respond (particularly thiazide diuretic)
- If K<3.5mmol/L) – consider adding/titrating MRA if not already on.
- If low magnesium <1.0mmol/L - consider oral supplementation
- Recheck blood electrolytes 1-2 weeks after initiation or dose increase

https://www.escardio.org/static-file/Escardio/Guidelines/publications/HFGuidelines-Heart-Failure-Web-Tables.pdf

HFrEF Prognostic Medicines – ACEi/ARB

ACEI dosing in Heart Failure

Drug	Initiation dose	Suggested Dose increments	Target dose
Ramipril	1.25mg twice daily	2.5mg twice daily	5mg twice daily
Lisinopril	2.5mg daily	5mg daily/ 10mg daily / 20mg daily / 30mg daily	35mg daily
Enalapril	2.5mg daily	2.5mg twice daily / 5mg twice daily / 10mg twice daily	20mg twice daily

ARB dosing in Heart Failure

Drug	Initiation dose	Suggested Dose increments	Target dose
Candesartan	4mg daily	8mg daily / 16mg daily	32mg daily
Losartan	12.5mg daily	25mg daily / 50mg daily / 100mg daily	150mg daily
Valsartan	40mg twice daily	80mg twice daily	160mg twice daily

Higher doses of ACEI associated with improved patient outcomes (reduced hospitalisations and QoL)– titrate to max tolerated / target dose
ACEI (or ARB) doses should be increased at two weekly intervals until the target or maximum tolerated dose is achieved dose is achieved.
Only use ARB where ACEI is contraindicated or not tolerated.

Monitoring
Renal function:

- Check renal function at baseline, within 2 weeks of initiation and after each dose increase
  - An increase in serum creatinine of up to 50% from baseline or serum creatinine of 266mmol/L is acceptable
  - An increase in potassium to <5.5mmol/L is acceptable
- If greater rise in creatinine or potassium are seen, review concomitant nephrotoxic drugs, consider reducing diuretic dose and recheck bloods
- If creatinine remains raised – halve dose of ACEi or ARB and recheck U&Es in 2 weeks. If remains raised seek specialist advice
- If serum creatinine increases by >100% or serum creatinine is > 310mmol/L – stop ACEI (or ARB) and seek specialist advice

Blood pressure

- Monitor BP at least annually throughout therapy and more regularly if clinically indicated
- Symptomatic hypotension may limit ACEI or ARB dose
- ACEI or ARB doses should be increased if systolic BP > 90mmHg AND the patient has no symptoms of hypotension
- Dose reduction may be necessary if the patient experiences dizziness or light-headedness – review other (non-prognostic) BP lowering drugs first and consider reducing diuretic dose if appropriate

https://www.escardio.org/static-file/Escardio/Guidelines/publications/HFGuidelines-Heart-Failure-Web-Tables.pdf

HFrEF Prognostic Medicines – Beta Blockers

Beta-blocker dosing in Heart Failure

Drug	Initiation dose	Suggested Dose increments	Target dose
Bisoprolol	1.25mg daily	2.5mg daily / 3.75mg daily / 5mg daily / 7.5mg daily	10mg daily
Carvedilol	3.125mg twice daily	6.25mg twice daily / 12.5mg twice daily	25mg twice daily if <85kg 50mg twice daily if > 85kg
Nebivolol **(only licensed in over 70s)**	1.25mg daily	2.5mg daily / 5mg daily	10mg daily

Beta-blocker doses should be increased at two to four weekly intervals until the target or maximum tolerated dose is achieved.

Monitoring

Blood pressure

- Symptomatic hypotension may limit beta-blocker dose titration
- Beta-blocker doses should be increased if systolic BP > 90mmHg AND the patient has no symptoms of hypotension
- Dose reduction may be necessary if the patient experiences dizziness or light-headedness – review other (non-prognostic) BP lowering drugs first

Heart rate

- Aim to increase the beta-blocker dose to achieve a resting heart rate of 50-60bpm (<80bpm in atrial fibrillation)
- Reduce the beta-blocker dose if resting heart rate drops to less than 50bpm (<60bpm in atrial fibrillation)

Worsening breathlessness / increasing ankle swelling

- Beta blockers may temporarily increase congestion after initiation or dose titration resulting in increased breathlessness or ankle swelling – consider increasing diuretic dose as required to manage symptoms and reassure patient that this will resolve. If persistent consider reducing beta blocker dose by one increment until symptoms resolve and then re-attempt dose titration

Fatigue

- Excessive tiredness may delay dose titration. Maintain or reduce beta-blocker dose by one increment until symptoms resolve and then re-attempt dose titration

https://www.escardio.org/static-file/Escardio/Guidelines/publications/HFGuidelines-Heart-Failure-Web-Tables.pdf

HFrEF Prognostic Medicines – mineralocorticoid receptor antagonists (MRA)

MRA are indicated for patients with HFrEF who are still symptomatic despite maximal tolerated / target dose of ACEI/ARB or BB

MRA dosing in Heart Failure

Drug	Initiation dose	Dose optimisation
Spironolactone	12.5-25mg daily	Increase to 50mg daily if still symptomatic after 4-6 weeks
Eplerenone	25mg daily	Increase to 50mg daily if still symptomatic after 4-6 weeks

Note: Do not initiate MRA if baseline serum potassium > 5.5mmol/L or serum creatinine > 200mmol/L

Monitoring

- MRA dose should be increased if they remain symptomatic and systolic BP > 90mmHg AND the patient has no symptoms of hypotension

Renal function

Check blood chemistry before and after starting MRA and after each dose increment. Once target or maximum tolerated dose reached, monitor treatment monthly for three months and then at least every 6 months, and at any time the person becomes acutely unwell.

- If K+ rises above 5.5 mmol/L or creatinine rises to 221 µmol/L)/eGFR <30 mL/min/1.73 m2 - halve dose and monitor blood chemistry closely.
- If K+ rises to >6.0 mmol/L or creatinine to >310 µmol (3.5 mg/dL) eGFR <20 mL/min/1.73 m2 - , stop MRA immediately and seek specialist advice.
- A specialist HF nurse may assist with education of the patient, follow-up (in person or by telephone), biochemical monitoring, and dose up-titration

Gynaecomastia

- Male patients treated with spironolactone may uncommonly develop breast discomfort or gynaecomastia (switching to eplerenone should be considered)

Blood pressure

- Symptomatic hypotension may limit MRA dose titration
- Dose reduction may be necessary if the patient experiences dizziness or light-headedness – review other (non-prognostic) BP lowering drugs first

https://www.escardio.org/static-file/Escardio/Guidelines/publications/HFGuidelines-Heart-Failure-Web-Tables.pdf

Prognostic Medicines: SGLT2 inhibitors in chronic heart failure

SGLT2i licensed dosing in Heart Failure

Drug	Initiation (and maintenance) dose
Dapagliflozin **(HFrEF :NICE TA 679** **HFpEF / HFmrEF: NICE TA June 23)**	10mg daily
Emapagliflozin **(HFrEF: NICE TA773** **HFpEF / HFmREF – guidance awaited)**	10mg daily

When **NOT** to prescribe:

- Those at risk of ketoacidosis – **avoid** if type 1 diabetic
  - If on insulin usual practice to reduce insulin by half – consult diabetologist for advice
  - If on sulphonylurea – advice is to half dose but consider if needed – use HbA1c to guide decision
  - Those on a ketone diet
- Risk of dehydration – avoid in those with diabetes in those undergoing surgery etc.
- Patients unable to adhere to good genital hygiene

Additional considerations

Diuretics

- On average SGLT2i will give an additional diuresis of approx 300ml per day.
- Following initiation may need to reduce diuretics – clinically review patient at follow up to assess.

Blood pressure

- Due to diuretic action – blood pressure may be reduced, continue if asymptomatic and systolic BP > 90mmHg.

Renal function

- Expect a reduction in eGFR of up to 4ml/min – long term there is data supporting renal protective effects.
- In the treatment of heart failure, patients enrolled in the clinical studies had a calculated CrCl > 20ml/min for empagliflozin and > 30ml/min for dapagliflozin. Additionally, the SPC for dapagliflozin suggests use down to CrCl of 15ml/min.
- Note if concomitant diabetes, if CrCl is less than 45ml/min, additional agents will be required for glucose control.

Concomitant diabetes

- **DO NOT prescribe in people with Type 1 diabetes.**
- In patients with type II diabetes and high baseline HbA1c / poor HbA1c control, large reductions in HbA1c may be seen – seek specialist advice
- In patients with well controlled type II diabetes or for those without diabetes, any change in HbA1c is negligible and as such there should be confidence when adding SGLT2 to existing therapy WITH THE EXCEPTION OF patients on insulin and/or insulin secretagogues such as sulphonylureas and meglitinides,
  - There is a small increased risk of diabetic ketoacidosis (DKA) of between 1/1,000 to 1/10,000 –similar to the risk of angioedema in ACE inhibitors.
    - ½ doses of insulin when initiating SGLT2i
    - ½ doses of sulphonylurea when initiating SGLT2i
- Dose reduction may be necessary if the patient experiences dizziness or light-headedness – but review other (non-prognostic) BP lowering drugs first and consider reducing diuretic dose if appropriate

Prognostic Medicines for HFrEF: Sacubitril Valsartan (ARNI)

Sacubitril valsartan dosing in Heart Failure

Drug	Initiation dose	Suggested Dose increments	Target dose
Sacubitril valsartan	24/26mg twice daily	49/51mg twice daily	97/103mg twice daily

Sacubitril valsartan doses could be increased at two to four weekly intervals until the target or maximum tolerated dose is achieved

Monitoring
Note: ACEI / ARB are NOT to be co prescribed with sacubitril valsartan - ensure an ACEi wash out period of at least 36 hours before initiating.
Note: If swapping from ARB to sacubitril valsartan, start when next dose of ARB was due (no need for wash out period).
Renal function:

- Check blood chemistry before and after starting Sacubitril valsartan and after each dose increment. Once target or maximum tolerated dose reached, monitor treatment monthly for three months and then at least every 6 months, and at any time the person becomes acutely unwell.
  - An increase in serum creatinine of up to 50% from baseline or serum creatinine of 266mmoll/L is acceptable
  - An increase in potassium to <5.5mmol/L is acceptable
- If greater rise in creatinine or potassium are seen, review concomitant nephrotoxic drugs and consider reducing diuretic dose and recheck bloods
- If creatinine remains raised – halve dose of sacubitril valsartan and recheck U&Es in 2 weeks. If remains raised seek specialist advice
- If creatine increases by >100% or serum creatinine is > 310mmol/L – stop sacubitril valsartan and seek specialist advice

Blood pressure

- Monitor BP at least annually throughout therapy and more regularly if clinically indicated
- Symptomatic hypotension may limit sacubitril valsartan dose
- Sacubitril valsartan doses should be increased if systolic BP > 90mmHg AND the patient has no symptoms of hypotension
- Dose reduction may be necessary if the patient experiences dizziness or light-headedness – but review other (non-prognostic) BP lowering drugs first and consider reducing diuretic dose if appropriate

Other drugs for use where HF symptoms persist despite first line therapy – under specialist advice

- **Ivabradine:** Indicated with New York Heart Association (NYHA) class II to IV stable chronic heart failure with systolic dysfunction and in sinus rhythm with a heart rate of 75 beats per minute(bpm) or more in combination with standard therapy including BB, ACEI and MRA or when betablocker therapy is contraindicated or not tolerated and where left ventricular ejection fraction is 35% or less

- **Hydralazine / nitrates:** consider offering hydralazine in combination with nitrate (especially if the person is of African or Caribbean family origin and has moderate to severe heart failure [NYHA class III/IV] with reduced ejection fraction; or in patients who cannot take ACEi / ARB / ARNI due to renal dysfunction

- **Digoxin:** recommended for worsening or severe heart failure with reduced ejection fraction despite first-line treatment for heart failure. Caution isf poor or declining renal function – risk of digoxin toxicity.

https://www.nice.org.uk/guidance/ng106

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Thank you

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Version tracker

Version	Edition	Changes Made	Date amended	Review due
1	1	New Framework	August 2023	August 2024