NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

Heart Failure, Heart MCN Guidelines for the Investigation and Management of Heart Failure

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

Primary Care
Suspicion of "New" Heart Failure

Essential Investigations: NT-pro BNP

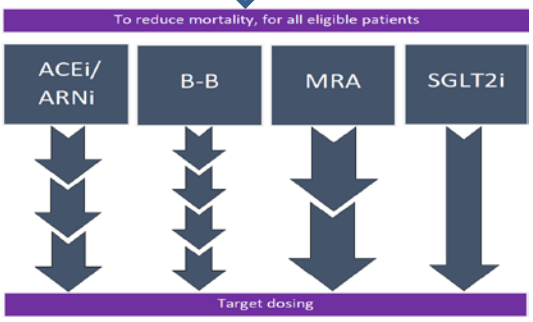
Ctrl & Click for detailed other essential investigations

Refer via Heart Failure Diagnostic Pathway. If NT-pro BNP > 400ng/L, patient will have consultant review and management plan

Patient has clinical syndrome of heart failure. Estimated left ventricular ejection fraction:

- ≥ 50% → Heart failure with preserved ejection fraction (HFpEF). See cardiologist management plan. Manage co-morbidities. Manage symptoms with diuretics. Prescribe SGLT2i. Not eligible for HFLNS at present. Read code *G583-2*. *Cntrl&Click HFpEF management*
- 40-49% → Heart failure with mildly reduced ejection fraction (HFmrEF). See cardiologist management plan. Prescribe ACEi/ARB, B-B, SGLT2i and consider MRA. Eligible for HFLNS. Read code *G58* and *585f*. *Cntrl&click HFmrEF management*
- < 40% → Heart Failure with reduced ejection fraction (HFrEF). ARNi/ACEi/ARB, B-B, MRA and SGLT2i are indicated. Aim to establish all four disease modifying therapies as quickly as possible. Up-titrate to target doses. Eligible for HFLNS. Read code *G58* and *585f*.

Manage Co-morbidities in All



HFrEF

Five year mortality for patients with HFrEF is greater than 50%. Establishing disease modifying therapy promptly (ideally within four weeks), up-titration as tolerated and long-term maintenance are essential.

Optimal guideline directed medical therapy (GDMT) is to establish patients on all core four classes of disease modifying drug therapy at target or maximally tolerated doses:

- ARNi/ACEi/ARB
- Beta-blocker
- MRA
- SGLT2i

Once the diagnosis is established, patients should continue to have up-titration of all four drug classes to target dose, even if their symptoms are improving.

Prompt initiation and up-titration of disease modifying therapies has been shown to reduce adverse outcomes for patients, including hospitalisation for heart failure and mortality.

Concurrent, rather than sequential initiation is the preferred strategy.

Loop diuretics may be used to alleviate symptoms. They should be reviewed regularly to ensure that the dose remains appropriate.

For patients with HFrEF and HFmrEF, the Heart Failure Liaison Nurse Service will manage initiation and up-titration of sacubitril/valsartan (ARNi). The other three drug classes can be managed between the HFLNS and primary care.

Annual Care

- NYHA classification
- Fluid status
- Blood pressure
- Heart rate and rhythm
- Medication review
- Vaccination status
- Lifestyle advice
- Renal function monitoring
- Read-code existing patients
- [Pregnancy / contraception counselling]

1. Essential Investigations

If patient symptoms and/or signs are suggestive of heart failure, check:

- NT-pro BNP blood test (< 400ng/L suggests heart failure is unlikely) - processed by labs Monday to Friday
- Full blood count (anaemia may cause breathlessness)
- If new symptoms of breathlessness are present, a chest x-ray should be considered (if not performed within the preceding six months). Chest x-ray may show suspicion of heart failure and/or lung disease
- HbA1c (high prevalence of diabetes in LVSD)
- Thyroid function tests (hypothyroidism may cause heart failure)
- Blood chemistry (renal function prior to initiation of disease modifying therapies)
- Echocardiogram (use Heart Failure Diagnostic Pathway; this will incorporate ECG and/or NT-pro BNP)
- Serum albumin (to exclude nephrotic syndrome)

The Heart Failure Liaison Nurse Service is not involved in initial investigations.

Click to return to guidelines for the investigation and management of heart failure

2. Personalised Management

The following is intended as a practical guide to utilising key disease modifying therapies in heart failure. An important evolution of this guideline is to move away from a 'sequenced' approach to the introduction of pharmacotherapies. Initiation of these agents should be based on individualised assessment of the patient's aetiology, symptom burden, clinical parameters and co-morbidities. For patients with HFrEF, aim to introduce all core four disease modifying therapies as soon as practically possible and then increase to target doses as tolerated, i.e. a clinician does not have to fully up-titrate an ACEi before introducing a beta-blocker.

3A. Core Treatment - Sacubitril/Valsartan (ARNi)

Who: HFrEF [left ventricular ejection fraction < 40%] to replace ACEi (or ARB) in patients who remain symptomatic despite optimal treatment. Should be considered as first-line therapy in de novo HFrEF patients.
Why: Improve quality of life, reduce hospitalisations and improve prognosis compared with ACEi (or ARB).
General advice: Similar efficacy to ACEi in patients with post-MI LVSD, without symptomatic heart failure.
Wash-out Period: If the patient is already prescribed an ACEi, the ACEi **MUST** be stopped 36 hours prior to initiation of sacubitril/valsartan to minimise the risk of angioedema. The importance of this wash-out period must **ALWAYS** be communicated directly to the patient, to the GP (in writing) and, if the person receives a weekly adherence aid, the community pharmacy (verbally, at the point the prescription is issued).
Monitoring: Baseline BP and U&Es, then re-check at one to two weeks following initiation and each up-titration to assess renal function/tolerability.
Troubleshooting: As for ACEi below (with the exception of cough).

Starting and target doses:

Patient Group	Dosing Advice
Not currently taking ACEi (or ARB) or stabilised on low doses of either of these agents	24/26mg twice daily for two to four weeks, increased as tolerated to 49/51mg twice daily for two to four weeks, then further increased as tolerated to 97/103mg twice daily
Currently stabilised on ACEi (or ARB)	49/51mg twice daily for two to four weeks, increased as tolerated to 97/103mg twice daily. Consider a starting dose of 24/26mg twice daily if systolic blood pressure less than 110 mmHg

Click to return to guidelines for the investigation and management of heart failure

3B. Core Treatment - ACEi

Who: HFrEF and selected HFmrEF patients.
Why: Improves symptoms and prognosis in all grades of heart failure.
General advice: Initiate at lowest dose and up-titrate to target or maximum tolerated dose. Combination with ARB is not recommended.
Monitoring: Baseline BP and U&Es, then re-check at one to two weeks following initiation and each up titration to assess renal function/tolerability.
Troubleshooting:

- If renal function is deteriorating (decrease in eGFR > 30%) consider stopping ACEi and seek specialist advice. Note some rise in creatinine, urea and potassium is to be expected after commencing ACEi. An increase in creatinine of up to 50% above baseline or 266umol/L, whichever is smaller, is acceptable.
- An increase of potassium to < 5.5mmol/L is acceptable. If serum potassium level > 5.5 and < 6mmol/L, reduce ACEi dose by 50% and re-check in one week. If serum potassium level is > 6mmol/L, stop ACEi and seek specialist advice.
- Caution – Pseudohyperkalaemia possible if sample collection is delayed.
- If ACEi is not tolerated due to persistent dry cough, substitute with an ARB licensed for use in heart failure (see below).
- Asymptomatic hypotension - continue unless severe (< 90mmHg systolic). Symptomatic hypotension - consider other contributing medicines and withdraw if possible to maintain/increase ACEi dose.

Starting and target doses:

ACE Inhibitor	Starting Dose	Target Dose
Ramipril	2.5mg once daily	5mg twice daily
Enalapril	2.5mg twice daily	10-20mg twice daily
Lisinopril	2.5mg once daily	20mg once daily (up to 35mg in BNF)
Captopril	6.25mg three times daily	50mg three times daily

Click to return to guidelines for the investigation and management of heart failure

3C. Core Treatment - ARB

Who: For patients unable to tolerate an ACEi in HFrEF and selected HFmrEF.
Why: Improves symptoms and prognosis in all grades of heart failure.
General advice: Initiate at lowest dose and up-titrate to maximum tolerated dose. Combination with an ACEi is not recommended.
Monitoring: As for ACEi.
Troubleshooting: As for ACEi.

Starting and target doses:

ARB	Starting Dose	Target Dose
Candesartan	4mg or 8mg once daily	32mg once daily
Losartan	12.5mg once daily	150mg once daily
Valsartan	40mg twice daily	160mg twice daily

Click to return to guidelines for the investigation and management of heart failure

3D. Core Treatment – Beta-Blocker

Who: All patients with LVSD, regardless of symptoms, should be started on beta-blocker therapy **as soon as their condition is stable** i.e. free from decompensated heart failure (unless contraindicated by a history of severe / life threatening asthma or heart block).
Why: Improves symptoms and prognosis in all grades of heart failure.
General advice: Initiate at lowest dose and up-titrate slowly at intervals of not less than two weeks to maximum tolerated dose. Beta-blocker treatment should be prescribed under the guidance of a health professional experienced in the management of heart failure. **Diltiazem or verapamil must be discontinued**.
Troubleshooting: Do not increase the dose if heart rate ≤ 50bpm and/or systolic blood pressure ≤ 90mmHg.

Starting and target doses:

Beta-blocker	Starting Dose	Target Dose
Bisoprolol	1.25mg once daily	10mg once daily
Carvedilol	3.125mg twice daily	25mg twice daily if < 85kg 50mg twice daily if > 85kg
Nebivolol*	1.25mg once daily	10mg once daily

* Nebivolol is restricted to use in people aged ≥ 70 years who are intolerant of both carvedilol and bisoprolol and only on the advice of an expert.

Other advice: Patients stabilised on another beta-blocker (e.g. for coronary artery disease or hypertension), consider substitution if clinically appropriate and the patient's heart failure condition is stable:

Current Dose of Atenolol	Approximate Equivalent Dose of Bisoprolol	Approximate Equivalent Dose of Carvedilol
25mg daily	1.25 – 2.5mg daily	6.25mg twice daily
50mg daily	2.5 - 5mg daily	12.5mg twice daily
> 50mg daily	5 - 10mg daily	12.5 - 25mg twice daily

Seek specialist advice if unsure. Equivalent dose chosen should be individualised after assessment of heart rate and blood pressure. Review heart rate, blood pressure and clinical symptoms ideally one week after substitution. Optimise the dose according to response.

Click to return to guidelines for the investigation and management of heart failure

3E. Core Treatment - MRA

Who: All HFrEF and selected HFmrEF patients. NHSGG&C Formulary: eplerenone is restricted to patients with LVEF ≤ 40%, or patients with post-MI LVSD accompanied by evidence of heart failure, both manifesting within 3-14 days of myocardial infarction. There are no specific restrictions on spironolactone.
Why: Improves symptoms and prognosis in HFrEF and post-MI LVSD patients (LVEF ≤ 40%).
Drug choice: Eplerenone or spironolactone are recommended. Gynaecomastia and mastalgia in males is more commonly associated with spironolactone than with eplerenone.
Cautions/seek specialist advice: Serum potassium > 5.0mmol/L and/or creatinine is, or ever has been > 220µmol/L. Note risk of pseudohyperkalaemia; prompt delivery of sample to the lab for analysis is preferable.
Monitoring: Baseline U&Es. Monitoring of U+Es two weeks post initiation/dose increase, three monthly for one year and six monthly thereafter. Monitoring will be undertaken by the HFLNS until the patient is stable, then per NPT LES. See SIGN guidelines for further support on interpretation, including expected changes in eGFR.
Sick Day Rules / Patient Information: Temporarily withhold treatment if diarrhoea and/or vomiting. If symptoms persist beyond 48 hours, seek expert advice (includes HFLNS) given increased risk of renal dysfunction and hyperkalaemia. Ensure patient has MRA monitoring card with relevant information about eplerenone/spironolactone.

Starting and target doses:

Mineralocorticoid Receptor Antagonist	Starting Dose	Target Dose
Eplerenone	25mg once daily	50mg once daily
Spironolactone	25mg once daily or alternate days	25-50mg once daily

Click to return to guidelines for the investigation and management of heart failure

3F. Core Treatment - SGLT2i

Who: All patients with HF, irrespective of LVEF.
Why: Reduce hospitalisations and improve survival.
General advice: Indicated in patients with and without diabetes.
Troubleshooting: If HbA1c > 90mmol/mol or < 60mmol/mol and/or prescribed insulin/sulfonylurea, seek specialist diabetes advice. Doses of furosemide/gliclazide/insulin may require reduction following initiation of SGLT2i.

Other advice: Contra-indicated in type 1 diabetes. Caution in patients with recurrent genital infections. Avoid dapagliflozin if baseline eGFR < 15mL/min/1.73m^2. Avoid empagliflozin if eGFR < 20mL/min/1.73m^2. Counsel on genital tract mycotic infection and Sick Day Rules (dehydration). If diabetic, counsel on the risk of DKA, including when to withhold treatment (e.g. dehydration/peri-operatively). Reduction in eGFR is expected following initiation of SGLT2i; it is not necessary to re-check renal function for this reason. It has been demonstrated that, with time, patients receiving SLGT2i experience a slower rate of decline in renal function compared with placebo.
Doses: Dapagliflozin 10mg once daily. Empagliflozin 10mg once daily.

Click to return to guidelines for the investigation and management of heart failure

3G. Loop Diuretic

Who: All patients with signs or symptoms of fluid retention (e.g. peripheral/pulmonary oedema and/or PND/orthopnoea and/or raised JVP).
Why: Symptomatic relief.
General advice: Use the lowest dose of furosemide necessary to relieve peripheral oedema and signs of pulmonary oedema. Start with oral furosemide 40mg once daily.
Troubleshooting:

- Daily timing need not be fixed and may be altered for social convenience. Dosing after 16:00 can lead to nocturia.
- If ineffective after three days, double the dose to 40mg twice daily, at 08:00 and 14:00
- If still ineffective, further increase the dose to 120mg daily and seek rapid specialist advice.
- Excessive diuretic therapy or intercurrent illness (vomiting/diarrhoea) can lead to dehydration, resulting in symptomatic hypotension, renal dysfunction and gout.
- In the elderly, symptoms of hypovolaemia may be non-specific; feeling washed out, confused, impaired mobility, falls and urinary incontinence.
- Bumetanide may be considered for patients who do not respond to furosemide. 1mg of bumetanide is equivalent to 40mg of furosemide.

Other advice:

- Monitor for symptoms/signs of sodium and water depletion:
    - Postural dizziness/light headedness
    - Excessive and sustained fall in blood pressure
    - Significant and sustained weight loss below usual dry weight (e.g. > 1kg, sustained over > 1 week).
    - If the patient has any such symptoms, check U&Es immediately and seek advice from HFLNS, who can rapidly access a specialist cardiologist for advice.
- Patient may be educated to adjust the dose, based on symptoms, signs, and changes in weight (if weighing regularly).
- In HFrEF or HFmrEF, the HFLNS may train suitable patients to take an extra dose for three days and will aim to follow up thereafter. If not improving, patient to phone HFLNS (may have 'just in case' prescription for this at home to cover this).

Click to return to guidelines for the investigation and management of heart failure

4. Additional Treatments

Ivabradine

Who: Adjunctive therapy in NYHA class II-IV patients in sinus rhythm whose heart rate is ≥ 75bpm, in combination with standard therapy including beta-blocker therapy, or when beta-blocker therapy is contra-indicated or not tolerated (under specialist guidance only).
Why: Reduces heart failure hospitalisations.
General advice: Recommended starting dose is 5mg twice daily (2.5mg twice daily if ≥ 75 years old) and target dose is 7.5mg twice daily. NB: **Ivabradine should not be initiated unless a beta-blocker has been considered and/or fully optimised**.

Device Therapy – CRT

Who: Potential additional therapy in appropriate patients with LVEF ≤35%. Such patients should be considered for device therapy on an individual basis. After optimisation of guideline directed medical therapy, device candidates should have updated echocardiography and an ECG. Those who remain symptomatic with LVEF ≤35% and QRS duration > 130ms should be referred for device therapy.
Why: In appropriate patients, cardiac resynchronisation therapy can improve both symptoms and prognosis. Implantable cardioverter defibrillator therapy can improve prognosis, though has no symptomatic benefit.

Digoxin

Who: Patients with symptomatic heart failure, in sinus rhythm and LVEF <40%.
Why: Reduces heart failure hospitalisations (though evidence is weak and pre-dates most modern treatments).
General Advice: Doses between 62.5micrograms and 250micrograms daily may be used, depending on body weight and renal function. Side effects include anorexia, nausea, vomiting, bradycardia, ventricular arrhythmias and visual disturbances (e.g. xanthopsia). In the elderly, symptoms may be non-specific; see section on fluid retention above. If these occur, check serum digoxin level.
Monitoring: Check U&Es before initiating therapy or if signs of toxicity (to exclude hypokalaemia and uraemia). Serum digoxin level can be of use, note a lower target than when used in atrial fibrillation (0.5-1 micrograms/L) is acceptable. Sample 6-24 hours post-dose.

Hydralazine/Isosorbide Dinitrate
Who: For patients intolerant of ARNi, ACEi or ARB due to renal dysfunction and/or hyperkalaemia.
Why: Improved prognosis (though evidence is weak, from small numbers and pre-dates most modern treatments).
General Advice: Initial dose hydralazine 25mg/isosorbide dinitrate 10mg three times daily, increasing gradually (as tolerated) to maximum dose hydralazine 75mg/isosorbide dinitrate 40mg three times daily.

Starting and target doses:

Starting Dose	Titration Step	Target Dose
Hydralazine 25mg three times daily	Hydralazine 50mg three times daily	Hydralazine 75mg three times daily
ISDN 10mg three times daily	ISDN 20mg three times daily	ISDN 40mg three times daily

Click to return to guidelines for the investigation and management of heart failure

5. Sick Day Rules

Counsel patients to seek medical advice if diarrhoea and/or vomiting persist for more than 48 hours.

6. Heart Failure with Mildly Reduced Ejection Fraction (HFmrEF)

The diagnosis of HFmrEF requires the presence of symptoms and/or signs of heart failure and a mildly reduced LVEF (41–49%). The presence of elevated natriuretic peptides (NT-pro BNP ≥ 125ng/L) and other evidence of structural heart disease (e.g. increased left atrial size, LVH or echocardiographic measures of LV filling) make the diagnosis more likely, but are not mandatory for diagnosis if there is certainty regarding the measurement of LVEF.

Diuretics are recommended to relieve congestion. ACEi (ARB if ACEi not tolerated), beta-blocker, SGLT2i and MRA should all be considered for management of this cohort.

Click to return to guidelines for the investigation and management of heart failure

7. Heart Failure with Preserved Ejection Fraction (HFpEF)

The diagnosis of HFpEF remains challenging. The European Society of Cardiology recommend that HFpEF be considered in those with symptoms and signs of heart failure, a LVEF of ≥ 50% and objective evidence of cardiac structural and/or functional abnormalities consistent with the presence of LV diastolic dysfunction/raised LV filling pressures, including raised natriuretic peptides. Management of atrial fibrillation, diabetes, chronic kidney disease, chronic obstructive pulmonary disease, dyslipidaemia, hypertension and obesity are recommended as potential modifiable cardiac risk factors. Diuretics are recommended to relieve congestion. Prescription of SGLT2i is indicated.

NB: patients with a history of overtly reduced LVEF (≤ 40%) who later present with LVEF ≥ 50%, should be considered to have recovered HFrEF or 'HF with improved LVEF' (rather than HFpEF). Continued treatment for HFrEF is recommended in these patients.

Click to return to guidelines for the investigation and management of heart failure

8. Frailty

Frailty is a multisystemic process leading to reduction of physiological reserve and a reduction in physical activity. Heart failure is recognised as a global cause of morbidity and mortality, increasing in prevalence over recent decades. Due to shared phenotypes and comorbidities, there is significant overlap and a bidirectional relationship, with frail patients being at increased risk of developing heart failure and vice versa. While an attempt should be made to establish all patients with heart failure on guideline directed therapy, not all patients will tolerate all four agents/all four agents at full dose (e.g. due to symptomatic hypotension). A person-centred approach, taking frailty and comorbidities into account is required to attain appropriate optimisation of therapy. Consider seeking advice from care of the elderly team.

NHSGG&C Frailty Guidelines can be found here.

9. Existing Patients

Patients with an existing diagnosis of heart failure (even if asymptomatic) should be reviewed at least annually, to ensure they are receiving optimal guideline directed medical therapy as outlined above.

Click to return to guidelines for the investigation and management of heart failure

10. Lifestyle Advice

Cardiac Rehabilitation
HFLNS may refer patients to the cardiac rehab program, including assessment for exercise.

Exercise
Patients with heart failure should remain as active as possible. Home based exercise and supervised cardiac rehabilitation is currently offered within NHSGG&C.
NYHA class I-II: Encourage regular aerobic exercise e.g. walking; gardening; bowling; golfing. Aim to undertake at least 30 minutes of moderate intensity physical activity on most days of the week. Use Live Active referral if requiring enhanced support and encouragement to get started.
NYHA class III-IV: Do NOT avoid gentle exercise. Start with small quantities; the best and safest exercise is simple walking; swimming is inadvisable. Live Active referral is not appropriate.

Alcohol
Alcohol is contraindicated in heart failure patients with alcoholic cardiomyopathy. All other patients should adhere to government guidelines for daily/weekly units, including alcohol free days. Excessive alcohol intake may contribute to fluid overload and increases calorific intake.

Smoking
All patients with heart failure should be strongly advised not to smoke and should be offered smoking cessation advice and support. Nicotine replacement therapy doubles the quit rate of smokers who want to stop. Consider referral to your local Smoke Free community pharmacy and/or to smoking cessation services. **Contact Quit Your Way 0800 848 484 or Quit Your Way Pharmacy 0141 201 4945 for further advice.**
https://www.nhsinform.scot/healthy-living/stopping-smoking

Nutrition
Fruit juices: Avoid cranberry juice if taking warfarin (increased potency). Avoid grapefruit juice if taking simvastatin (interference with metabolism).
Food supplements: Avoid St. John's Wort (interactions with warfarin/digoxin/eplerenone)
Salt: High salt consumption increases water retention; patients with heart failure should avoid salt intake > 6g/day. Avoid salt rich foods e.g. cheese, bacon and ham, tinned meat, sausages and pre-made meat dishes (beef burgers; pies), crisps, salted peanuts and other salty snacks, smoked fish, most "fast" foods, tinned and packeted soup and stock cubes.

- Use low salt foods instead e.g. fresh fish, fruit, poultry and meat, fresh vegetables cooked without salt
- Do not add salt at the table. **Avoid salt replacements e.g. LoSalt (high potassium content)**, soy sauce, marmite
- Use herbs, spices, mustard or lemon to flavour instead
- Consider the salt content in medicines, including soluble tablets and some antacids

Consider dietetic referral, especially in ethnic groups with specific dietary considerations.

Obesity
Encourage small step changes towards modest and realistic weight loss targets. Aim for smaller portion sizes and reduced intake of fat and sugary foods; think of cakes and biscuits as an occasional treat. Consider referral to NHSGGC Weight Management Service.

Cachexia
Encourage small and regular eating pattern. Offer advice regarding calorie dense foods. A leaflet is available from Health Promotion (0141 201 4915). Consider dietetic referral, particularly when considering oral nutritional supplements.

Click to return to guidelines for the investigation and management of heart failure

11. Annual Care

Symptom Classification:

New York Heart Association Class	Functional Capacity	Annual Mortality
I	No symptoms and no limitation in ordinary physical activity	3-5%
II	Mild symptoms and slight limitation during ordinary activity; comfortable at rest	10%
III	Marked limitation in activity due to symptoms, even during less-than-ordinary activity; comfortable only at rest	12-15%
IV	Severe limitations; experiences symptoms even while at rest	15-20%

Ensure that the patient is receiving maximally tolerated pharmacotherapy. If already achieved and symptoms persist or increased NYHA class, contact HFLNS for advice around onward referral to cardiologist and/or palliation. Some patients may be persistently symptomatic though stable and therefore do not require further HF Team involvement; seek advice if unsure. If NYHA class IV due to HFrEF, ensure that the HFLNS is/has been involved and that the patient is on the Gold Standards Framework/Palliative Care register.

Fluid status
See section 3G above.

Heart Rate/Rhythm
Document heart rate at least annually to determine the optimal beta-blocker dose. Patients in sinus rhythm should ideally have a resting heart rate of approximately 60bpm. Patients with (historical) atrial fibrillation should receive more lenient heart rate control (e.g. 80bpm). If new irregularity is detected, consider atrial fibrillation. Refer to NHSGGC AF guidelines**:** Atrial Fibrillation Management (135) (nhsggc.org.uk)

Medication Adherence
Ask about medicines taking behaviour and explain the purpose of each medicine. If the patient has comprehension or adherence difficulties, seek specialist advice from the Pharmacy Heart Failure Service (0141 201 6021).

Medicines to Avoid
Ensure that medicines to be avoided in heart failure have not been inappropriately commenced (e.g. NSAIDs; rate limiting calcium channel blockers; pioglitazone; oral corticosteroids; clozapine; moxonidine). This list is not exhaustive and there may be certain clinical situations where benefits outweigh the risks of therapy. Personalised treatment and clinician judgement should be employed.

Renal Function Monitoring
Patients should have U+Es checked at least annually, even if there are no changes to pharmacotherapy. Patients receiving eplerenone or spironolactone should be followed-up per Near Patient Testing Local Enhanced Service. It is important that patients receiving a mineralocorticoid receptor antagonist understand that this is not an acute prescription; rather, it should be maintained following satisfactory U+Es check.

Click to return to guidelines for the investigation and management of heart failure

12. Palliative and Supportive Care

Patients with heart failure who remain symptomatic or continue to have hospital admissions, despite guideline directed medical therapy, should be considered for a collaborative cardiology and palliative approach to care. While preventative cardiological therapies should continue where clinically appropriate, quality of life issues such as management of both cardiac and non-cardiac symptoms is essential. Signposting to financial, social and psychological support should also be provided following assessment. Early identification of patients with ongoing symptoms and unmet needs allows for interventions to improve quality of life, and additionally affords time to identify patient preferences and priorities of care necessary to develop tailored medical anticipatory care plans. While most patients require a generalist palliative approach integrated with their cardiac care, access to specialist palliative care should be made available when required.

Click to return to guidelines for the investigation and management of heart failure

13. Pregnancy / Contraception

For women with heart failure, there may be risks associated with pregnancy and delivery to both themselves and their baby. Risk factors include underlying heart failure aetiology, LV function, arrhythmia, medication and co-morbidities. It is important to consider the context of ongoing medical therapy when assessing left ventricular function. Consideration should be given to the impact of sudden withdrawal of some therapies (e.g. ACEi/ARB/ARNi/SGLT2i) in pregnancy.

It is advised that women with heart failure:
- avoid unplanned pregnancy and that a planned pregnancy is informed through access to pre-conception counselling
- are provided with information on safe and effective methods of contraception relevant to their cardiac condition
- do not have heart failure treatments withheld because of their reproductive potential

If a woman with heart failure informs you that she is pregnant, discuss initial management and therapies with a heart failure specialist; some therapies are suitable for ongoing use in pregnancy following informed discussion with the woman (e.g. beta-blockers; diuretics). Early referral to the QEUH cardio-obstetric service will support decision making relating to continuation and monitoring of a pregnancy.

Several contraceptive options are suitable in the context of heart failure. These include progesterone-only methods such as the pill, implant or coil. Further information on the safety of contraceptives in the context of medical conditions can be found at https://www.fsrh.org/standards-and-guidance/uk-medical-eligibility-criteria-for-contraceptive-use-ukmec/

Pre-conception counselling may also be appropriate for some men with congenital/inherited conditions.

Further information and resources for both healthcare professionals and patients are available from the Scottish Obstetric Cardiology Network via https://www.socn.scot.nhs.uk

Click to return to guidelines for the investigation and management of heart failure

14. Heart Failure Liaison Nurse Service

To arrange follow up for patients who have had recent admission to hospital with heart failure due to LVSD and who are currently unknown to the service, contact your local HFLNS. This may be done by phone (see below) or in writing, but not via cardiology SCI referral. Please note that the HFLNS does not have additional information regarding waiting times for patients who have already been referred through the Heart Failure Diagnostic Pathway.

Once heart failure symptoms are stable, treatment is optimised and appropriate self-management and social needs are met, patients will no longer receive planned HFLNS support. Any patient who develops worsening heart failure symptoms may re-access the service, either through their GP as indicated above, or may contact the HFLNS themselves:

- Glasgow Royal Infirmary: 0141 242 9847
- Inverclyde Royal Hospital: 01475 505 130
- New Stobhill Hospital: 0141 355 1840
- New Victoria Hospital: 0141 347 8076
- Queen Elizabeth University Hospital: 0141 451 6132
- Royal Alexandra Hospital: 0141 314 9701
- West Glasgow Ambulatory Care Hospital: 0141 201 0383

Click to return to guidelines for the investigation and management of heart failure