



NHS GGC Guidelines for THE INVESTIGATION AND MANAGEMENT OF LEFT VENTRICULAR SYSTOLIC DYSFUNCTION (LVSD)

DIAGNOSIS The basis for a historical diagnosis of heart failure should be reviewed and only patients who have confirmed LV systolic dysfunction on echo should be managed in accordance with this guideline. For a suspected new diagnosis use the heart failure diagnostic pathway.

ESSENTIAL INVESTIGATIONS – if patient symptoms and/or signs suggest LVSD

- > FBC (anaemia may cause breathlessness)
- > CXR (may confirm CHF or show lung disease)
- > Blood glucose (high prevalence of diabetes in LVSD (any cause))
- > TFTs (hypothyroidism may cause heart failure)
- > Blood chemistry (renal function pre ACE-I)
- > Echocardiogram (use heart failure diagnostic pathway, this will incorporate ECG and/or BNP)
- > Serum albumin to exclude nephrotic syndrome

NON-PHARMACOLOGICAL MEASURES

LIFESTYLE CHANGES

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)

High salt consumption increases water retention. Patients with CHF should avoid salt intake > 6g/day. Salt avoidance – avoid salt rich foods e.g. cheese, bacon and ham, tinned meat, sausages and made up meat dishes (beefburgers, pies), crisps, salted peanuts and other salty snacks, smoked fish, most "fast" foods, tinned and packet soup and stock cubes.

- use low salt foods instead e.g. fresh fish, fruit, poultry and meat, fresh vegetables cooked without salt.
- don't add salt at table. **Avoid salt replacements e.g. Lo Salt (high potassium content)**

Try to use herbs, spices, mustard or lemon to add flavour instead
Consider dietician referral, especially ethnic groups with specific dietary considerations

OBESITY

Encourage small stepped changes towards modest weight loss targets – try smaller portions on the plate, reduce fat and sugary foods. Think of cakes, biscuits etc as occasional treats. Consider referral to GGC Weight Management Service or Shape-up

CACHEXIA

Encourage small and often eating, give advice regarding calorie dense foods

Leaflet available from Health Promotion – 0141 201 4915. Consider referral to dietician
Checking exactly how to get leaflet

ALCOHOL

Alcohol is contraindicated in those with alcoholic cardiomyopathy. Otherwise can be taken in SMALL quantities, 1 or 2 units/day

SMOKING

All patients with CHF should be strongly advised not to smoke and should be offered smoking cessation advice and support. NRT doubles the quit rate of smokers who want to stop. Consider referral to your local Smoke free Pharmacy or to smoking cessation support groups.

Contact Smokefree Smokeline 0800 84 84 84 or Smokefree Pharmacy 0141-201-4945 for further advice –

EXERCISE

Patients should keep as active as possible. NYHA class 1 and 2 - encourage regular aerobic exercise e.g. walking, gardening, bowling, golfing. Aim to accumulate 30 minutes or more of moderate intensity physical activity over the course of most days of the week. Use Live Active referral if needs more support and encouragement to get started. NYHA class 3 or 4 - do not avoid gentle exercise. Start with small amounts; the best and safest exercise is simply walking; swimming is not advisable. Live Active referral NOT appropriate.

COMPLIANCE AND PHARMACY INPUT

Non adherence to heart failure medicines is very common and causes excess hospitalisations. Repeated, regular discussion between patient and pharmacist in the community can increase medicine adherence behaviour. If you suspect low adherence use the pharmacy compliance link on Heart Failure LES template to refer. Advise the patient that pharmacy will be in touch within two weeks to arrange this. Community Pharmacy Heart Failure Service contact: 0141-201 5654, fax 0141-201 5314. For healthcare professionals looking for specialist pharmacist advice on heart failure please also contact 0141-201 5654.

IMMUNISATION

Offer all CHF patients annual influenza immunisation and once only pneumococcal immunisation

PHARMACOLOGICAL MEASURES

DRUG INTERACTIONS

Consider stopping any drug which may precipitate or aggravate heart failure including over the counter e.g. NSAIDs including COX 2s, Glitazones, verapamil, diltiazem and high salt preparations (e.g. soluble painkillers).

ACE INHIBITORS

Improve symptoms and prognosis in all grades of heart failure. All patients with LVSD should be treated with an ACE-I regardless of symptoms

- > Begin at lowest dose and uptitrate.
Target doses of ACE-I: ramipril 5mg twice daily (or 10mg once daily), lisinopril 30-35mg once daily or enalapril 10-20mg twice daily.
- > U&E must be checked at one week following initiation and each up-titration to assess renal function
- > If renal function deteriorating (decrease in GFR of >30%), consider stopping ACE-I and seek specialist advice
- > If Serum potassium level is > 5.5 and < 6.0 reduce the ACE-I dose by 50% and re check in a week, if the serum potassium level is >6.0 stop ACE-I and seek specialist advice
- > If ACE-I not tolerated due to persistent dry cough, substitute with an angiotensin receptor blocker (ARB) licensed for use in heart failure (see below).

BETA-BLOCKERS

Improve symptoms and prognosis in all grades of heart failure.

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 asthma or heart block).

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.**

Uptitrate slowly at intervals of not less than two weeks to target (or maximally tolerated) dose (carvedilol 25mg twice daily, (50 mgs twice daily if >85kgs), bisoprolol 10mg, nebivolol 10mg). Nebivolol is restricted to use only in those >70 who are intolerant of both carvedilol and bisoprolol, and only on the advice of an expert.

Do not increase dose if heart rate ≤50bpm or systolic blood pressure ≤90mmHg.

Patients stabilised on another b-blocker (for e.g. CHD or hypertension), consider substituting if clinically appropriate and patient's heart failure condition is stable e.g. if atenolol: total daily dose ≤50mg switch to 2.5mg bisoprolol once daily or 12.5mg carvedilol twice daily; if total daily dose >50 mg switch to 5mg bisoprolol once daily or 25mg carvedilol twice daily

TREATMENT OF FLUID RETENTION (peripheral or pulmonary oedema or raised JVP)

Use the lowest dose of furosemide necessary to relieve peripheral oedema and signs of pulmonary oedema.

- > Start with furosemide 40mg per day orally
- > Daily timing need not be fixed. Timing can be changed for social convenience. Dosing after 4pm can lead to nocturia.
- > If not effective in three days, double dose – 40mgs bd, 8am and 2pm
- > If still not effective, increase up to 120mg and seek rapid specialist advice.
- > Excessive diuretic therapy or intercurrent illness with vomiting/diarrhoea can lead to dehydration causing hypotension, renal dysfunction and gout.
- > In the elderly, symptoms of hypovolaemia may be non-specific – washed out, confused, impaired mobility, falls, urinary incontinence

Symptoms/signs of sodium and water depletion are

- > postural dizziness / light-headedness
- > excessive and sustained fall in blood pressure
- > significant and sustained weight loss below usual dry weight (e.g. > 1 Kg, sustained over >1 week)

If patient has any such symptoms, measure U&Es immediately and seek advice from Heart Failure Liaison Service who can rapidly access a specialist cardiologist for advice
STILL SYMPTOMATIC (despite optimal treatment with ACE-I or ARB and beta-blocker) in moderate to severe heart failure?

Patients should be referred for specialist advice on further management options e.g. spironolactone, eplerenone, combined ACE-I/ARB therapy, ivabradine, digoxin, bendroflumethiazide



INFORMATION FOR HEART FAILURE SPECIALISTS ONLY

MINERALOCORTICOID RECEPTOR ANTAGONIST (Spironolactone / Eplerenone)

To be considered as add on therapy to ACE-I and beta blocker in NYHA II-IV heart failure (under specialist guidance only)

Agent of choice is spironolactone 25 once daily (50mg once daily in exceptional situations), or eplerenone 25-50mg if hormonal side-effects with spironolactone.

Contra-indicated if serum potassium >5 mmol/l and/or creatinine is, or ever has been, >220µmol/l
Monitoring of urea and electrolytes: 1 week, 3 weeks and 7 weeks after initiation, every 4 weeks for 3 months, then every 3 months for 1 year and every 6 months thereafter. Monitoring will be undertaken by the HFLNS until patient is stable.

Temporarily stop treatment if there is vomiting/diarrhoea. If symptoms persist >48hrs seek expert advice (includes HFLNS) because of increased risk of renal dysfunction/hyperkalaemia. Ensure patient has spironolactone or eplerenone monitoring card with information about the drug

ANGIOTENSIN II RECEPTOR BLOCKERS

>For patients intolerant of ACE-I due to side-effects, most commonly cough

>As add on therapy in patients with ongoing symptoms in spite of ACE-I and beta-blocker, and intolerant of mineralocorticoid receptor antagonists (under specialist guidance only)

Begin at lowest dose and slowly uptitrate to target dose

Target doses of AIIRB's: Candesartan 32mg, Valsartan 160mg twice daily (post-MI heart failure only)
If on monotherapy use the same monitoring as per ACE-I. If on dual therapy (i.e. ACE-I and AIIRB) then use the same monitoring as per mineralocorticoid receptor antagonist.

IVABRADINE

To be considered as add on therapy in NYHA II-IV, in patients in sinus rhythm and whose heart rate is ≥75 bpm, in combination with standard therapy including beta-blocker therapy or when beta-blocker therapy is contra-indicated or not tolerated (under specialist guidance only). Recommended starting dose is ivabradine 5 mg twice daily (2.5mg twice daily if ≥ 75 years old) and target dose is 7.5 mg twice daily
NB- Ivabradine should not be initiated unless a beta-blocker has been considered and/or fully optimised

HYDRALAZINE-ISOSORBIDE DINITRATE

For patients intolerant of ACE-I or AIIRB due to renal dysfunction and/or hyperkalaemia
Initial dose hydralazine 25mg /isosorbide dinitrate 10mg three times daily to a maximum of hydralazine 75mg/ISDN 40mg tid

25mg Hydralazine	ISDN 10mg
50mg Hydralazine	ISDN 20mg
75MG Hydralazine	ISDN 40mg

DIGOXIN

Can be considered in patients with symptomatic heart failure, sinus rhythm and LVEF <40%

Dose 62.5-250mcg depending on body weight and renal function

Side effects include anorexia, nausea, vomiting, bradycardia, ventricular arrhythmias, xanthopsia
In the elderly, symptoms may be non-specific – see section on fluid retention above. If these occur, check blood digoxin level.

Check U&Es before initiating therapy or if signs of toxicity (to exclude hypokalaemia and uraemia).

DEVICE THERAPY

The following groups of heart failure patients should be seen by a cardiologist to consider device therapy: Appropriate patients with severe left ventricular dysfunction (ICD)
Appropriate patients with moderate to severe left

ventricular dysfunction, NYHA III-IV and a QRS >120ms (CRT)

Appropriate patients with moderate to severe left ventricular dysfunction and QRS>150ms, regardless of symptoms (CRT)

HOME DAILY WEIGHT MONITORING

Advise patient that early reporting of increased breathlessness/ankle oedema can reduce chance of hospitalisation by early intervention with e.g. increased diuretic therapy.

Record weight when no oedema - "DRY" weight. Large dial scales for those with poor vision, or standard

bathroom scales are available if patient unable to provide own. (Contact HFLNS-see over).

Ask patients with recent symptoms or signs of fluid retention to record weight daily. Measure at the same time each day, preferably on rising, before dressing and after emptying bladder. If >three day sustained increase of at least

1kg, then increase furosemide by 40mg. Seek specialist advice if difficulty in maintaining dry weight.

HEART FAILURE LIAISON NURSE SERVICE

If the patient has a hospital admission for worsening heart failure due to LVSD, they will be offered follow-up and support from the Heart Failure Liaison Nurse Service (HFLNS). If you identify such a patient within four weeks of discharge who has not been picked up by the service, contact the HFLNS to arrange follow-up (see contact details overleaf).

HFLNS will also provide education groups for those newly diagnosed through direct access echo or as an out-patient. If any HF patient wishes to attend these sessions at another time, please contact the HFLNS (see over)

PATIENTS WITH ATRIAL FIBRILLATION

Prescribe warfarin (or a novel oral anticoagulant, see AF guideline and formulary restrictions) for prevention of stroke unless contraindicated.

Otherwise prescribe aspirin 75mg

Avoid using verapamil or diltiazem for rate control (may precipitate or aggravate LVSD)

Ensure referral for cardiology review and advice.

Beta-blocker is first choice for rate control with the addition of digoxin if contraindicated / not tolerated or additional rate control required

PATIENTS WITH ANGINA

For anginal control in addition to beta-blocker therapy (see above re substitution), consider adding nitrates, nicorandil, amlodipine or ivabradine (**under specialist guidance only**) if required.

Avoid diltiazem, nifedipine or verapamil which may aggravate LVSD.

Consider referral for coronary risk stratification and suitability for revascularisation.

If already taking a statin/aspirin then continue; if not taking and has proven atherosclerotic disease (angina, prior MI, CABG/PCI, CVA, PAD) consider introducing on an individual basis - what is the patient's prognosis and are atherosclerotic events likely during the remainder of the patient's life?

PALLIATIVE CARE

A collaborative cardiology and palliative care approach should be considered for all patients with heart failure who continue to have symptoms despite optimally tolerated heart failure therapy. This should include a review of the patient's symptoms, clinical assessment including fluid balance, assessment of biochemistry and review of medications prescribed for symptom management and for prognostic benefit. Non-essential medications or those where side effects are problematic should be stopped. Patients with defibrillators (ICD or CRT-D) should have regular review to ensure that device activation remains appropriate. Where a defibrillator is to be deactivated this is best done in a controlled setting but can be done acutely if necessary. Pacemakers or cardiac resynchronisation systems with a pacemaker only (CRT-P) can remain active and will not cause pain or prolong life. All patients should have a holistic assessment with a clear management plan and where appropriate an anticipatory care plan developed and

communicated to all members of the multidisciplinary team. This plan should clearly state the priorities of care including resuscitation status and preferred place of care. Out patients who are felt to be in a palliative category should be placed on the palliative care register. The HFLNS is integral to facilitation of the management plans, establishing priorities of care and coordination of care.

"Treatment of very frail should be guided by individual circumstances and co morbidities and need not follow guideline recommendations"

SERVICE CONTACT DETAILS

If the patient is known to the heart failure service then contact the hospital nurse and if not known to the heart failure service then please contact on of the community nurses (LES nurses)

Heart Failure nurse liaison service

Western Infirmary

Level 4 CRI, Dumbarton Road, Glasgow G11 6NT
Tel 0141 211 6379, Fax 0141 211 1755

Glasgow Royal Infirmary

Ward 43, 45 Jubilee Building, 10 Alexandra Parade
Glasgow G31 2 ER
Tel 0141 211 4543, Fax 0141 211 4950

Stobhill Hospital

Cardiac Rehab, Ground floor ACH Building, Stobhill
Glasgow G21 3UW
Tel 0141 355 1302, Fax 0141 355 1750

Victoria Infirmary

3rd Floor, McQuaker Building, Langside Road,
Glasgow G42 9TY
Tel 0141 201 5727/Fax 0141 201 5018

Southern General

Rm 6, Management Building, 1345 Govan Rd
Glasgow G51 4TF
Tel 0141 2011185, Fax 0141 201 1337

Royal Alexandra Hospital

Level 5 North, RAH, Corsebar Rd, Paisley PA2 9PN
Tel 0141 314 6729, Fax 0141 314 7077

Inverclyde Royal Hospital

Room E17, IRH, Larkfield Rd, Greenock PA 16 0SN
Tel 01475 505 130, Fax 01475 504 337

Vale of Leven Hospital

Alexandria G83 0UA
Tel 01389 817 374, Fax 01389 314 7077

Community heart failure clinical nurse specialists (LES nurses)

North Glasgow: Stobhill, Cardiac Rehab Office, Ground Floor, Stobhill ACH, Glasgow G21 3UW
Tel 0141 355 1840, Fax 0141 3551750

Clyde area: Royal Alexandra Hospital Estates Building, Corsebar Road, Paisley PA2 9PN
Tel 0141 314 9701, Fax 0141 314 7348

South Glasgow: Victoria Infirmary, 3rd Floor, McQuaker Building, Langside Road, Glasgow G42 9TY
Tel 0141 201 5727, Fax 0141 201 5018

Messages left on an answering machine will be picked up and responded to every two or three hours (during office hours).

