

Rotherham PCT– Heart Failure Prescribing Guidelines

Diuretics in Heart Failure Management

- Loop diuretics (furosemide and bumetanide) are the mainstay in symptom control in heart failure, although there is limited evidence that they provide a mortality benefit.
- There is no evidence to support that either furosemide or bumetanide is more effective.
- There is no evidence to support a particular dose of a diuretic, the dose should be increased gradually to control symptoms
 - If a person is taking a thiazide diuretic it should be stopped before a loop diuretic is started.
 - Use the lowest dose of furosemide or bumetanide necessary to relieve fluid overload and breathlessness (ankle and pulmonary oedema) without causing dehydration, risking renal dysfunction or hypotension
 - It is rarely necessary initially to use more than furosemide 80mg daily or bumetanide 2mg daily, however the dose required varies greatly between patients.
 - For patients with mild to moderate heart failure fluid restriction of no more than 2 litres a day may be considered before increasing the dose of diuretics. Fluids should be further restricted in end-stage heart failure patients. Care is needed to avoid dehydration.
 - Serum potassium should be monitored, especially after a dose adjustment, and maintained in the range 3.6-5.3 mmol/l
 - If higher doses are required contact, the specialist heart failure service
- A thiazide diuretic (bendroflumethazide and metolazone) can be used in synergy with a loop diuretic, in cases of severe fluid overload. This will result in a powerful diuresis and should be initiated only on advice from the specialist heart failure service
- Diuretics should never be used alone in the management of heart failure.

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ACE inhibitors in Heart Failure Management

- Heart Failure diagnosis confirmed; initiate ACE inhibitor (ramipril/lisinopril) and titrate upwards.
- Recommended doses = ramipril 10mg daily / lisinopril 30-35mg daily
- If the patient is taking ramipril 10mg daily or lisinopril 30-35mg daily or the maximum tolerated dose of ramipril or lisinopril, then no further action is required move to beta-blockers section
- If the patient is on a less than ramipril 10mg daily or lisinopril 30-35mg daily
 - Check if the patient has failed to tolerate a higher dose.
 - Titrate the dose up to the recommended dose of ramipril 10mg daily or lisinopril 30-35mg daily (See Appendix 1A+1B)
- If the patient is on an alternative ACE inhibitor
 - Check the dose is appropriate for heart failure
 - If the dose is not suitable for the treatment of heart failure
 - Check if the patient has failed to tolerate a higher dose
 - Titrate dose to an appropriate dose for heart failure (See BNF).

Angiotensin Receptor 2 Antagonist (AR2A)

- Candesartan is the AR2A recommended for heart failure patients unable to tolerate a ACE-inhibitor due to ACE-inhibitor induced coughing
 - Clinical trials demonstrate that approximately 1 in every 15-20 can not tolerate an ACE inhibitor.
 - Heart failure is also associated with a high incidence of coughing and care must be taken to ensure that the coughing is due to the ACE inhibitor and not the heart failure.
- Recommended doses = candesartan 32mg daily
- If the patient taking candesartan 32mg daily Then no further action is required move to beta-blockers section
- If the patient is on a less than candesartan 32mg daily.
 - Check if the patient has failed to tolerate a higher dose
 - Titrate dose to 32mg daily or the maximum tolerated dose (See Appendix 1C)

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Hydralazine & Nitrates

In a minority of patients who have contraindications to ACE inhibitors and AR2As (usually due to renal impairment) a combination of hydralazine (maintenance dose 50-75mg four times a day) and isosorbide dinitrate (40-160mg, occasionally 240mg daily in divided doses) can be used in the maintenance of heart failure. This regimen will be initiated in hospital or under the supervision of a heart failure specialist.

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Beta-Blockers in Heart Failure Management

Once the ACE inhibitor/AR2A has been titrated to the recommended or maximum tolerated dose, ADD a beta-blocker and titrate upwards.

Three beta blockers are licensed for the treatment of heart failure; bisoprolol, carvedilol and nebivolol

The PCT recommended beta-blocker = **bisoprolol (nebivolol in patients over 70)**

- The recommended doses for the treatment of heart failure =
 - Bisoprolol 10mg daily
 - Nebivolol 10mg daily (Recommended for patients over 70)
 - Carvedilol 25mg twice daily (50mg twice daily if the patient is more than 85kg).

- If the patient is on a sub-optimal beta-blocker dose.

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- The dose of the ACE inhibitor/AR2A has been titrated to ramipril 10mg daily or lisinopril 30-35mg daily or candesartan 32mg daily or the maximum tolerated dose



- Titrate to the optimal beta-blocker dose for heart failure or the maximum tolerated dose (See appendix 2A+2B+2C).

- If the patient is on a sub-optimal beta-blocker dose.

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- The dose of the ACE inhibitor/AR2A is sub-optimal and has **NOT** been titrated to ramipril 10mg daily or lisinopril 30-35mg daily or candesartan 32mg daily or the maximum tolerated dose.



- First titrate the dose of ACE inhibitor/AR2A to the optimal maintenance dose for heart failure (Ramipril 10mg daily or lisinopril 30-35mg daily or candesartan 32mg daily or the maximum tolerated dose) (See appendix 1A+1B+1C).



- Then titrate the beta-blocker dose to the optimal dose for heart failure or the maximum tolerated dose (See appendix 2A+2B+2C).

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Pharmacological Risk Reduction

- Antiplalets
 - All patients should be taking Aspirin 75mg daily (unless contraindicated) if the cause of heart failure is a consequence of atherosclerotic arterial disease (unless contraindicated).
 - Ensure BP is controlled before initiating aspirin (140/90mmHg, 140/80mmHg if a type 2 diabetic)
 - Patients contraindicated aspirin may be suitable for clopidogrel (see South Yorkshire clopidogrel guidelines)
 - Patients may be taking aspirin + clopidogrel for 12 months post a MI without ST-elevation after which time the clopidogrel should be stopped (See South Yorkshire clopidogrel guidelines for further details)

- Hypertension Management
 - Once patients have been stabilised on an ACE-inhibitor + a beta-blocker, ensure BP is controlled (140/90mmHg, 140/80mmHg if a type 2 diabetic).
 - A thiazide diuretic (bendroflumethazide) will act synergistically with the loop diuretics and may result in an excessive diuresis and should be avoided.
 - Verapamil, diltiazem and short acting-dihydropyridines such as nifedipine can cause deterioration and should be avoided.
 - Doxazosin should also be avoided in heart failure.
 - If further anti-hypertensive medication is necessary **amlodipine** would be the most suitable additional agent.

- Cholesterol Management
 - Treat as secondary prevention and commence simvastatin 40mg daily
 - Aim to reduce total cholesterol by 25% or to below 5mmol/l (LDL < 3 mmol/l which ever is greater)

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Second Line Agents in the Treatment of Heart Failure

It is anticipated that these agents will be initiated and doses titrated under guidance from the Heart Failure Specialist Service.

▪ Spironolactone

- Used in patients with severe heart failure at a dose of 25-50mg daily
- Potassium must be monitored closely when initiating spironolactone in patients already taking an ACE inhibitor or AR2A.
- Spironolactone must not be used in patients with a baseline serum potassium > 5mmol/l or serum creatinine > 220 micromol/l
- If the potassium is above 5.3 mmol/L, then either reduce spironolactone dose to 12.5mg daily or use on alternate days.

▪ Digoxin

- Digoxin is useful in managing symptoms in patients who are in sinus rhythm and symptomatic despite ACE-inhibitor and beta-blocker therapy at appropriate doses.
- Dose is dependent on body mass and renal function. Digoxin serum levels should be monitored after initiation, prior to and after any dose alterations.
 - Consider monitoring digoxin levels if;
 - U&E's deteriorate (creatinine > 150mmol/l). There is no requirement to measure serum digoxin levels in patients with stable renal impairment even if creatinine levels are >150mmol/l. Routine annual or six monthly monitoring will be adequate. Serum digoxin levels **must** be checked if renal function deteriorates.
 - Signs of toxicity include anorexia, nausea, vomiting, diarrhoea, fatigue, visual disturbances, drowsiness, dizziness and confusion.

Rotherham PCT Heart Failure Specialist Service

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