The Management of Heart Failure in Primary Care
Service Guideline

Originally developed by the South Central Cardiovascular Network and adapted by the Oxfordshire Cardiac Commissioning Group for local implementation in Oxfordshire. These groups both include clinicians from primary care, secondary care and community services.

1. Introduction

Currently the management of heart failure in general practice will vary depending on general practitioner’s (GP) experience, skills, knowledge and the availability services locally.

To reduce inequality and promote a standardised service based on quality and prevention the South Central cardiovascular network has outlined a primary care pathway for patients with suspected or confirmed heart failure based on national guidelines and local expertise. This level of service is expected for all appropriate patients to ensure optimum management of the condition is achieved within General Medical Services (GMS).

The GP has the responsibility to coordinate the care throughout the pathway ensuring timely access to diagnostic and management interventions following the initial presentation of symptoms. Heart failure creates a significant economic burden and more importantly compromising patients’ quality of life.

The future of heart failure services is dependent on GP’s commissioning reliable high-quality healthcare and evidence suggests considerable savings can be made by ensuring patients have access to early diagnosis, appropriate prescribing and support with compliance. It is estimated heart failure costs the NHS around 2% of the budget with 70% of the cost incurred due to hospital admissions, however commissioning a service which incorporates evidence based interventions may reduce the financial burden by 24%, and the annual number of deaths by 1,300.

2. Definition of Heart Failure

Heart failure is a complex clinical syndrome of symptoms and signs that suggest the efficiency of the heart as a pump is impaired caused by structural or functional abnormalities of the heart. Some patients have heart failure due to left ventricular systolic dysfunction (LVSD) which is associated with a reduced left ventricular ejection fraction. Others have heart failure with a preserved ejection fraction (HFPEF).

Most of the evidence on treatment is for heart failure due to LVSD. The most common cause of heart failure in the UK is coronary artery disease, and many patients have had a myocardial infarction in the past.

3. Incidence, Prevalence and Activity

The incidence of heart failure is estimated between 1 and 5 cases per 1000 population per annum. This increases steeply with age to as high as 40 per 1000 per annum in those aged over 76 years. Therefore, as many as 63,000 new cases of heart failure are diagnosed each year in the UK (34,000 in men and 29,000 in women). The average GP will see 2 or 3 new patients with heart failure every year based on an incidence of approximately 1 case per 1000 population per year.

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1 Sutherland, K (2010), Bridging the quality gap: heart failure, London: The Health Foundation
2 NICE Costing 2010
It is estimated that heart failure affects 1-2% of the population, which means that between 600,000 and 900,000 people in the UK have the condition. Therefore, a GP with a list of 2000 patients is likely to be caring for 20-30 patients with heart failure. Patients have frequent contact with primary care, requiring on average 11-13 contacts per year with the GP or other members of the primary care team. By contrast, drug costs in heart failure account for a very small proportion of the total cost of care, around 9%\(^4\). There is considerable variation in the prevalence of heart failure by primary care trusts in South Central (0.1% to more than 1.6%) and that patients are potentially under-diagnosed and, therefore, not receiving optimal levels of care.

4. National Drivers

**National Institute for Health and Clinical Excellence (NICE)**

The NICE clinical guideline on chronic heart failure published in August 2010 best practice advice that takes into consideration patients’ needs and preferences by bringing together new high-quality evidence from randomised controlled trials in diagnosis, treatment, rehabilitation and monitoring. The guideline recommends that care should be appropriately commissioned and delivered by a multidisciplinary team with an integrated approach across the healthcare community to reduce recurrent hospital stays, improve clinical outcomes by prolonging and improving quality of life and reducing inequalities.

**Care Quality Commission**

A review of heart failure services in 2007\(^5\) provides the following recommendations:

- all patients with suspected heart failure are identified and offered effective investigations to confirm or refute a diagnosis;
- all patients with a confirmed diagnosis have access to specialist staff, services and the full range of recommended treatments to optimise their clinical condition and quality of life;
- audit the delivery of care to ensure the best outcomes for patients and to demonstrate the cost benefits of delivering services;
- commissioners should review their local recorded prevalence for heart failure against national predicted rates;
- commissioners should put arrangements in place to ensure that all patients with suspected heart failure have rapid access to the key defining investigations to confirm or refute the diagnosis;
- commissioners should work together with service providers to ensure that all patients with confirmed heart failure have access to the specialist advice and services they require;
- commissioners should specify and commission cost effective models of multidisciplinary service delivery seamlessly encompassing both primary and secondary care.

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\(^4\) Damien

Clinical Presentation

Acute HF or decompensated chronic HF may include:
- dyspnoea (shortness of breath) – at rest/minimal activity, orthopnoea, paroxysmal nocturnal dyspnoea
- associated symptoms, e.g. chest pain, palpitations, altered consciousness

Chronic HF with non-specific symptoms may include:
- dyspnoea of variable severity, peripheral oedema, fatigue, nocturia, anaemia, abdominal bloating, constipation, cerebral symptoms (dizziness and confusion)
- no symptoms – incidental finding from echocardiogram

Complications of HF include:
- arrhythmias, cachexia, depression, sexual dysfunction

Refer to NICE CG 108 and NICE CG 187

5. Diagnosis

5.1 History and examination findings

The history has to be interpreted in the context of the past medical history. Breathlessness in patients with a history of myocardial infarction is commonly associated with the onset of heart failure.

Abnormal physical findings in heart failure may include:
- Tachycardia, irregular pulse
- Elevated jugular venous pressure or positive hepato-jugular reflux
- A third heart sound
- Laterally displaced apical impulse
- Pulmonary rales that do not clear with coughing

A pathological third heart is a highly specific clinical signs but is often clinically difficult to identify. Rales and/or a displaced apical impulse are present in about a third of patients. Jugular venous distension and peripheral oedema are important physical findings however their absence does not exclude heart failure. Peripheral oedema is common but a rather non-specific finding and other causes (e.g. varicose insufficiency and immobility in the elderly) need to be considered.
5.2 Predisposing factors and differential diagnosis

There are a number of predisposing factors that are common in patients with heart failure. These include:

<table>
<thead>
<tr>
<th>Factors leading to development of heart failure</th>
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</thead>
<tbody>
<tr>
<td>- Ischaemic heart disease</td>
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<td>- Valvular heart disease</td>
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<tr>
<td>- Arrhythmias (particularly uncontrolled atrial fibrillation and flutter)</td>
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<tr>
<td>- Hypertension</td>
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<tr>
<td>- Left ventricular hypertrophy</td>
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<tr>
<td>- Smoking (particularly in men)</td>
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<tr>
<td>- Hyperlipidaemia</td>
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<tr>
<td>- Diabetes mellitus</td>
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<tr>
<td>- Microalbuminuria is an independent predictor of heart failure (HOPE trial)</td>
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<tr>
<td>- Obesity</td>
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<tr>
<td>- Asymptomatic left ventricular systolic dysfunction (LVSD)</td>
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</table>

There are also a number of other conditions that may present with similar clinical features:

<table>
<thead>
<tr>
<th>Conditions presenting with similar clinical features</th>
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<tbody>
<tr>
<td>- Obesity</td>
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<tr>
<td>- Chest disease – including lung, diaphragm or chest wall</td>
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<tr>
<td>- Venous insufficiency in lower limbs</td>
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<tr>
<td>- Drug-induced ankle swelling (e.g. dihydropyridine calcium channel blockers)</td>
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<tr>
<td>- Drug-induced fluid retention (e.g. NSAIDs)</td>
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<tr>
<td>- Hypoalbuminaemia</td>
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<tr>
<td>- Intrinsic renal or hepatic disease</td>
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<tr>
<td>- Pulmonary embolic disease</td>
</tr>
<tr>
<td>- Depression and/or anxiety disorders</td>
</tr>
<tr>
<td>- Severe anaemia or thyroid disease</td>
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<tr>
<td>- Bilateral renal artery stenosis</td>
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5.3 Diagnostic Pathway

Given the uncertainties that are intrinsic to a clear diagnosis of heart failure on physical examination alone, and the outcome for patients left undiagnosed it is important that a defined pathway should be followed.

The pathway includes the use of electrocardiography (ECG) and serum natriuretic peptide (SNP) testing (B-Type Natriuretic Peptide (BNP) or N-terminal pro-B-type natriuretic peptide (NTProBNP)) as essential diagnostic tools to assist the GP. Performing an ECG will reduce the indiscriminate use of BNP testing which increases cost effectiveness and ensures good clinical practice. Mandatory inclusion of ECG in the pathway is a variance from the NICE guidelines but consensus from clinical leads in South Central suggest this is an important diagnostic tool which should not be disregarded.

The following flowchart outlines the agreed criteria for use within the Oxfordshire PCG. They refer to all patients presenting with symptoms in which heart failure is suspected. Referral forms on (EMIS-web) can be used for both GPwSI referrals and secondary care referrals using the same e mail single point of access – heartfailure.oxford@nhs.net

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Patient presents with symptoms suggestive of heart failure

Take a detailed history and perform a clinical examination
- Respiratory rate, pulse, blood pressure, weight, peripheral perfusion
- Check for signs of raised jugular venous pressure, laterally displaced apex beat, tachycardia, 3rd heart sound (e.g. gallop rhythm), murmurs, lung crackles, enlarged liver (due to engorgement), ascites, dependent oedema (legs and scrotum)
- Urinalysis & blood tests (full blood count, urea & electrolytes, creatinine, liver function tests, thyroid function, lipids, glucose (fasting if possible)
- Lung function – if pulmonary pathology suspected
- Chest X-ray

Perform an ECG on all patients
(a heart failure diagnosis is unlikely in the context of an entirely normal ECG)

Heart failure syndrome suspected?

Does the patient meet clinical criteria for referral without BNP measurement?

Urgent Referral
- New onset fast atrial fibrillation or flutter (>120 /min)
- Known moderate or severe valvular disease
- Creatinine >200µmol/l or EGFR <30ml/min
- Previous documented myocardial infarction
- High risk/hospital admission imminent

Routine referral
- Known LV dysfunction, recent decompensation
- Currently under cardiology follow up
- Co existent angina or ischaemic heart disease
- Specialist opinion wanted regardless of BNP result
- Cardiac murmur
- ECG showing : LBBB, LVH or anterior Q waves
- New onset atrial fibrillation (<120/min)

Criteria for referral without BNP not met

Measure BNP and review result within 24 hours

ORH units BNP >116pmol/l
RBH labs use NTproBNP >2,000 pg/ml
Urgent referral

ORH units BNP 29-116pmol/l
RBH labs use NTproBNP 400 – 2,000 pg/ml
Routine referral

ORH units BNP <29pmol/l
RBH labs use NTproBNP < 400 pg/ml
Consider alternative diagnosis/investigations

All referrals via email  heartfailure.oxford@nhs.net
Forms available on DXS and the OCCG Intranet
Further recommended investigations:

<table>
<thead>
<tr>
<th>Test Recommendations</th>
<th>Finding</th>
<th>Suspected Diagnosis</th>
</tr>
</thead>
</table>
| Chest x-ray          | Cardiomegaly  
Pulmonary venous congestion  
Interstitial fluid  
Pulmonary disease | Heart failure  
Lung conditions |
| Full blood count     | Anaemia | Heart failure due to or aggravated by decreased oxygen carrying capacity |
| Urinalysis           | Proteinuria  
Red Blood Cells or cellular casts | Nephrotic syndrome  
Glomerulonephritis |
| Serum creatinine     | Elevated | Volume overload due to renal failure |
| Serum albumin        | Decreased | Increased extravascular volume due to hypoalbuminemia |
| T4 and TSH (obtain only if atrial fibrillation, evidence of thyroid disease, or patient age >65) | Abnormal T4 or TSH | Heart failure due to or aggravated by hypo/hyperthyroidism |

6. Management of Heart Failure

6.1 Initial Management (while waiting for specialist review)

If symptoms are sufficiently severe they warrant treatment while waiting for echocardiography and specialist assessment.

Consider prescribing a loop diuretic⁷:

- Furosemide is the preferred choice of diuretic - usually given once daily in the morning but may be given twice daily for additional diuresis, titrate the dose to control symptoms. Bumetanide may be more effective in patients who are severely oedematous.

Specific monitoring recommendations for patients prescribed a loop diuretic:

- measure renal function and serum electrolytes prior to treatment initiation and check 1-2 weeks after treatment commencement and after each change in dose
- earlier monitoring (within 5-7 days) may be required for patients with:
  - existing renal impairment taking a combination of a loop diuretic plus an angiotensin-converting enzyme (ACE) inhibitor, angiotensin-II receptor antagonist, aldosterone antagonist and thiazide

Secondary care specialist advice recommended:

- symptoms are severe and do not respond to diuretics
- patient is pregnant
- patient has angina, atrial fibrillation or flutter, or another symptomatic arrhythmia
- viral, alcoholic, or toxic cardiomyopathy is suspected
- Associated valvular heart disease

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6.2 Management following diagnosis

Some patients have heart failure due to left ventricular systolic dysfunction (LVSD) which is associated with a reduced left ventricular ejection fraction. Others have heart failure with a preserved ejection fraction (HFPEF, also known as Diastolic Heart Failure). The majority of evidence on treatment is for heart failure due to LVSD; therefore for those with HFPEF management should be in consultation with a cardiologist. The following recommendations are based around patients with LVSD.

6.3 Left ventricular systolic dysfunction (LVSD), also known as Systolic Heart failure

LVSD can be classified using the New York Association Classification:

<table>
<thead>
<tr>
<th>New York Heart Association Classification of Heart Failure (NYHA)</th>
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<tbody>
<tr>
<td>Class I</td>
<td>Impaired LV but no symptoms</td>
</tr>
<tr>
<td>Class II</td>
<td>Breathless on moderate exertion e.g. 2 flights of stairs, walking briskly, walking uphill</td>
</tr>
<tr>
<td>Class III</td>
<td>Breathless during everyday activities, e.g. walking around the house</td>
</tr>
<tr>
<td>Class IV</td>
<td>Symptoms at rest e.g. unable to eat a meal comfortably without dyspnoea</td>
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</tbody>
</table>

There are a number of both pharmacological and non-pharmacological strategies that can be utilised in the management of heart failure. They can be delivered in predominantly in primary care with support from secondary care cardiology services. The main elements of care are outlined in the algorithm below:

6.4 Key Prescribing Points

♦ All patients with LVSD should be considered for ACE inhibitor and beta-blocker therapy. ACEI is usually started first.

♦ Aim for the target dose of ACEI and beta-blocker. Some is better than none though, and a little of each is better than lots of one and none of the other.

♦ Cough is common in heart failure. ACEI cause cough in some patients. The effect of ACEI on survival is more certain than that of angiotensin receptor blockers. Do not rule out ACE inhibitors until absolutely certain that the drug is causing the cough.

♦ Beta-blockers are often tolerated & not contra indicated in COPD, peripheral vascular disease or diabetes mellitus. Wheeze may be present periodically in heart failure and COPD. Do not stop the beta-blocker unless you are absolutely certain it is causing bronchospasm.

♦ If there are symptoms of postural hypotension from taking all the medication in the morning, consider giving ACEI in the evening.

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NYHA
6.5 Monitoring

- All patients with chronic HF require monitoring including: – a clinical assessment of functional capacity, fluid status, cardiac rhythm (at least examining the pulse), cognitive status and nutritional status
- a review of medication, including need for changes and possible side effects
- serum urea, electrolytes, creatinine and eGFR
- When a patient is admitted to hospital because of HF, seek advice on their management plan from a specialist in HF
Echocardiogram confirms LVSD

Remove Aggravating Factors
NSAID’s, Steroids, Tricyclics, Glitazones, Verapamil, Diltiazem

Identify/Exclude Treatable Causes
Hypertension, Valvular/Ischaemic Heart Disease

Lifestyle Modification
Smoking, salt & fluid intake, exercise, alcohol
Advice - Flu/Pneumococcal Vaccine

Diuretics - ONLY if
Fluid retention/dyspnoea - Furosemide 40mg or Bumetanide 1mg, titrate up or down as needed for symptom control & watch U/E

ACE Inhibitors and Beta-Blockers (licensed for HF)
All patients with LVSD – unless contraindicated
- ACE-I; start low and titrate upwards at e.g. 2 weekly intervals until maximum tolerated or target dose achieved regardless of symptom control (see appendix 1 for detail)
- 1st line choices & target doses; Ramipril 10mg (preferred) or Lisinopril 30mg
- For patients intolerant of ACE due to cough, consider Angiotensin II receptor antagonist; candesartan is preferred choice, target dose 32mg
- Monitor serum urea, creatinine & electrolytes at initiation and each dose increment; see section 6.5 below for advice on results.
- Beta-blocker; initiate even if rendered asymptomatic by ACE +/- diuretic
  - Start low and titrate upwards slowly (see appendix 2 for detail)
  - 1st line choices & target doses; Bisoprolol 10mg od or carvedilol 25mg bd – if previously on a non-selective beta-blocker, switch to one licensed for heart failure
  - Assess heart rate, blood pressure and clinical status after each titration

Seek specialist advice and consider adding one of the following if a patient remains symptomatic despite optimal therapy with an ACE inhibitor and a beta-blocker
- An aldosterone antagonist licensed for HF (especially if NYHA class II–IV an MI within the past month). See Appendix 3 for further details on starting spironolactone.
- An angiotensin II receptor antagonist (ARB) licensed for HF (especially if NYHA class II–III)
- Hydralazine in combination with nitrate (especially if the patient is of African or Caribbean origin and has NYHA class III–IV)

Other drugs to consider
Digoxin is recommended for:
- Worsening or severe heart failure due to LVSD despite ACE-I, beta-blocker and diuretic therapy
- Patients in AF with heart failure; heart rate control best achieved with a beta-blocker but digoxin may be added if rate control is inadequate or beta-blocker not tolerated

Ivabradine: For patients in sinus rhythm intolerant of beta blockade or with a heart rate >75 on beta blockade. Cardiologist review required.

Calcium Channel blockers
Amlodipine could be considered for the treatment of co-morbid hypertension / angina in patients with heart failure but verapamil or short acting dihydropyridine agents should be avoided

Aspirin & Simvastatin
Aspirin (75mg od) and simvastatin (40mg od) should be prescribed for patients with the combination of heart
6.6 Rehabilitation

- Offer a supervised group exercise-based rehabilitation programme designed for patients with HF as appropriate. The programme may be incorporated within an existing cardiac rehabilitation services.
- Include a psychological and educational component in the programme.
- Available via referral to HF Community Nursing team. See referral guidelines here

6.7 Long-term Support and Follow-up - HEART FAILURE SPECIALIST NURSES. (HFSNs)

Evidence suggests HFSNs play a vital role in the management of people with heart failure caused by LVSD. The recommended number of full time nurses is 1 per 100,000 population for patients with heart failure and systolic dysfunction alone*. Local data suggests each nurse has the ability to manage an average of 70 referrals per year however this may vary according to local protocols. This specialist support has the potential to save over £1800 per patient mainly from avoided acute admissions due to early intervention strategies. The nurses have the ability to manage patients autonomously and free up GP time by recognising the symptoms of deterioration, titrating medication and providing educational programmes based around self-management and lifestyle modification.

This aspect of the service is increasingly important as the diagnostic pathway is implemented to ensure adequate support is available for newly diagnosed patients. Without HFSNs any savings from avoided admissions in the diagnostic stage may be lost. Quality support for patients and their families is paramount following diagnosis as it is estimated over 40% of patients will not survive for more than 18 months. Community HFSN should have an agreed competency framework and should have an integrated time commitment and infrastructure with secondary care for education, training and continued professional development to ensure and maintain quality standards.

At present it is recommended only patients with LVSD are referred to HFSN services as other types of heart failure (e.g. HFPEF) require management in consultation with a cardiologist. However as evidence emerges on the management of these patients there is no reason why a competent HFSN could not manage a range of patients with appropriate training. The ratio of nurse per patient population would need to be reviewed to allow for an increased capacity to take on new groups of patients.

*Diastolic heart failure which accounts for 50% of heart failure presentations is not included in this calculation.

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9 BHF report  
Below is an outline of the HFSN main responsibilities:

**Education**

- Symptom recognition
- Promoting self-management
- Lifestyle modification
- Cardiac rehabilitation
- Training provision for colleagues e.g. practice & community nurses

**Nurse-led clinics and home visits as required**

- Assessment
- Medication optimisation
- Initiate /titrate medication
- Multi-disciplinary referral

**Palliative Care**

- Symptom assessment
- Symptom relief
- Social care assessment and liaison with other services
- Bereavement support

**Other**

- Telephone support service
- Admission avoidance through self-management and early intervention
- Discharge planning and liaison with secondary care teams
- Professional advice and support to colleagues e.g. community matrons
- Future service development could include IV therapy
7 Other Complex Interventions

7.1 Cardiac Resynchronisation

Cardiac resynchronisation therapy has been associated with a reduction in all-cause mortality by 28% and new hospitalisations for worsening heart failure by 37%.

There are two types of implantable device for congestive heart failure:

- A cardiac resynchronisation therapy with a pacing device (CRT-P)
- A cardiac resynchronisation therapy with a defibrillator device (CRT-D)

NICE recommend CRT-P as a possible treatment where these circumstances apply:

- For people with moderate to severe heart failure affecting daily life (NYHA class II – IV)
- Regular heart beat but ECG show the electrical system is not working properly (are in sinus rhythm either with a QRS duration of 120 ms or longer estimated by standard. *)
- Left ventricular ejection fraction is 35% or less
- They are receiving optimal pharmacological therapy

NICE recommend CRT-D as a possible treatment where these circumstances apply:

- All patients with an ejection fraction <30% where prognostic intervention is appropriate.
- The person is also suitable for an implantable cardioverter defibrillator

* Evidence published since the NICE review suggests that patients with atrial fibrillation and ejection fraction of less than 35% and prolonged QRS duration may also benefit.

7.2 Transplantation

Management of advanced Heart Failure with transplantation should be considered on an individual case basis.

Appendix 1: Practical recommendations on the use of ACE Inhibitors

11 The current role of cardiac resynchronization therapy in reducing mortality and hospitalization in heart failure patients: a meta-analysis from clinical trials
Rossi A, Rossi G, Piacenti M, Startari U, Panchetti L, Morales M A

12 NICE (2007, reviewed 2010), Cardiac resynchronisation therapy for the treatment of heart failure: technology appraisal guidance
120, London: NICE
### Which ACE inhibitor and what dose?

<table>
<thead>
<tr>
<th>Licensed ACEI</th>
<th>Starting dose (mg)</th>
<th>Target dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramipril (preferred)</td>
<td>2.5 once daily</td>
<td>5 twice daily or 10 once daily</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>2.5–5.0 once daily</td>
<td>30–35 once daily</td>
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</table>

*Target dose based on manufacturer’s recommendation rather than large outcome study

### How to use
- Start with a low dose (see above)
- Seek specialist advice where the patient is on a high dose (e.g. furosemide 80 mg) of a loop diuretic
- Double dose at not less than 2 weekly intervals
- Aim for target dose (see above) or, failing that, the highest tolerated dose
- Remember some ACE inhibitor is better than no ACE inhibitor
- Monitor blood electrolytes (in particular potassium), urea, creatinine, and blood pressure
- When to stop up-titration/down-titration – see ‘Problem solving

### Advice to patient
- Explain expected benefits
- Treatment is given to improve symptoms, to prevent worsening of heart failure and to increase survival
- Symptoms improve within a few weeks to a few months
- Advise patients to report principal adverse effects (i.e. dizziness/symptomatic hypotension, cough)

### Problem solving
- Asymptomatic low blood pressure does not usually require any change in therapy

**Symptomatic hypotension * also see Appendix 4**
- If dizziness, light-headedness and/or confusion and a low blood pressure consider discontinuing nitrates, calcium channel blockers* and other vasodilators
- If no signs/symptoms of congestion consider reducing diuretic dose
- If these measures do not solve problem seek specialist advice
*Calcium channel blockers should be discontinued unless absolutely essential (e.g. for angina or hypertension).

**Cough**
- Cough is common in patients with chronic heart failure, many of whom have smoking-related lung disease
- Cough is also a symptom of pulmonary oedema which should be excluded when a new or worsening cough develops
- ACE inhibitor induced cough rarely requires treatment discontinuation
- If the patient develops a troublesome dry cough which interferes with sleep and is likely to be caused by an ACE inhibitor, consider substituting an angiotensin II receptor antagonist for the ACE inhibitor

**Worsening renal function**
- Some rise in urea, creatinine and K+ is to be expected after initiation of an ACE inhibitor; if the increase is small and asymptomatic no action is necessary
- An increase in creatinine of up to 50% above baseline, or to 200 μmol/litre, which ever is the smaller, is acceptable
- An increase in K+ to ≤ 5.9 mmol/litre is acceptable
- If urea, creatinine or K+ do rise excessively consider stopping concomitant nephrotoxic drugs (e.g. NSAIDs), non-essential vasodilators (e.g. calcium antagonists, nitrates), K+ supplements/retaining agents (triamterene, amiloride) and, if no signs of congestion, reducing the dose of diuretic
- If greater rises in creatinine or K+ than those outlined above persist despite adjustment of
concomitant medications the dose of the ACE inhibitor should be halved and blood chemistry rechecked, if there is still an unsatisfactory response specialist advice should be sought

- If K+ rises to ≥ 6.0 mmol/litre or creatinine increases by > 100% or to above 350 μmol/litre the dose of ACE inhibitor should be stopped and specialist advice sought
- Blood electrolytes should be monitored closely until K+ and creatinine concentrations are stable

Note: it is very rarely necessary to stop an ACE inhibitor and clinical deterioration is likely if treatment is withdrawn; ideally, specialist advice should be sought before treatment discontinuation

Adapted from *European Journal of Heart Failure* 2001, 3, 495-502 (McMurray et al. Practical recommendations for the use of ACE inhibitors, beta-blockers and spironolactone in heart failure: putting guidelines into practice), copyright (2001), with permission from European Society of Cardiology.
Appendix 2 Practical recommendations on the use of beta-blockers

Which beta-blocker and what dose?

<table>
<thead>
<tr>
<th></th>
<th>Starting dose (mg)</th>
<th>Target dose (mg)</th>
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<tbody>
<tr>
<td>Bisoprolol</td>
<td>1.25 once daily</td>
<td>10 once daily</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>3.125 twice daily</td>
<td>25–50 twice daily*</td>
</tr>
</tbody>
</table>

* Carvedilol: maximum dose 25 mg twice daily if severe heart failure. for patients with mild to moderate heart failure maximum dose 50 mg twice daily if weight more than 85 kg – otherwise maximum dose 25 mg twice daily

How to use

- Start with a low dose (see above)
- Double dose at not less than 2 weekly intervals
- Aim for target dose (see above) or, failing that, the highest tolerated dose
- Remember some beta-blocker is better than no beta-blocker
- Monitor heart rate, blood pressure, clinical status (symptoms, signs, especially signs of congestion, body weight)
- Check blood electrolytes, urea and creatinine 1–2 weeks after initiation and 1–2 weeks after final dose titration
- When to down-titrator/stop up-titrator, see ‘Problem solving’

Advice to patient

- Explain expected benefits
- Emphasise that treatment given as much to prevent worsening of heart failure as to improve symptoms; beta-blockers also increase survival
- If symptomatic improvement occurs, this may develop slowly (3–6 months or longer)
- Temporary symptomatic deterioration may occur (estimated 20–30% of cases) during initiation/up-titrator phase
- Advise patient to report deterioration (see ‘Problem solving’) and that deterioration (tiredness, fatigue, breathlessness) can usually be easily managed by adjustment of other medication; patients should be advised not to stop beta-blocker therapy without consulting their physician
- Patients should be encouraged to weigh themselves daily (after waking, before dressing, after voiding, before eating) and to consult their doctor if they have persistent weight gain

Problem solving

Worsening symptoms/signs (e.g. increasing dyspnoea, fatigue, oedema, weight gain)

- If increasing congestion, double dose of diuretic and/or halve dose of betablocker (if increasing diuretic does not work)
- If marked fatigue (and/or bradycardia, see below) halve dose of beta-blocker (rarely necessary)
- Review patient in 1–2 weeks; if not improved seek specialist advice
- If serious deterioration, halve dose of beta-blocker or stop this treatment (rarely necessary); seek specialist advice

Low heart rate

- If < 50 beats/min and worsening symptoms – halve dose beta-blocker or, if severe deterioration, stop beta-blocker (rarely necessary)
• Consider need to continue treatment with other drugs that slow the heart (e.g. digoxin, amiodarone, diltiazem) and discontinue if possible
• Arrange ECG to exclude heart block
• Seek specialist advice

**Asymptomatic low blood pressure**
• Does not usually require any change in therapy

**Symptomatic hypotension**
• If low blood pressure causes dizziness, light-headedness or confusion, consider discontinuing drugs such as nitrates, calcium channel blockers and other vasodilators
• If no signs/symptoms of congestion consider reducing diuretic dose
• If these measures do not solve problem seek specialist advice

Note: beta-blockers should not be stopped suddenly unless absolutely necessary (there is a risk of a ‘rebound’ increase in myocardial ischaemia/infarction and arrhythmias); ideally specialist advice should be sought before treatment discontinuation

Adapted from *European Journal of Heart Failure* 2001, 3, 495-502 (McMurray et al. *Practical recommendations for the use of ACE inhibitors, beta-blockers and spironolactone in heart failure: putting guidelines into practice*), copyright (2001), with permission from European Society of Cardiology.
Appendix 3: Practical recommendations for the use of spironolactone

<table>
<thead>
<tr>
<th>Which dose of spironolactone?</th>
</tr>
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<tbody>
<tr>
<td><strong>Dose (mg)</strong></td>
</tr>
<tr>
<td>12.5–25 daily *</td>
</tr>
<tr>
<td>* 50 mg may be advised by a specialist if heart failure deteriorates and no problem with hyperkalaemia</td>
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<table>
<thead>
<tr>
<th>How to use</th>
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<tbody>
<tr>
<td>• Start at 25 mg once daily (12.5 mg in the elderly)</td>
</tr>
<tr>
<td>• Check blood chemistry at: 1, 4, 8 and 12 weeks; 6, 9 and 12 months; 6 monthly thereafter</td>
</tr>
<tr>
<td>• If K+ rises to between 5.5 and 5.9 mmol/litre or creatinine rises to 200 μmol/litre reduce dose to 25 mg on alternate days and monitor blood chemistry closely</td>
</tr>
<tr>
<td>• If K+ rises to ≥ 6.0 mmol/litre or creatinine to &gt; 200 μmol/litre stop spironolactone and seek specialist advice</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Advice to patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Explain expected benefits</td>
</tr>
<tr>
<td>• Treatment is given to improve symptoms, prevent worsening of heart failure and to increase survival</td>
</tr>
<tr>
<td>• Symptom improvement occurs within a few weeks to a few months of starting treatment</td>
</tr>
<tr>
<td>• Avoid NSAIDs not prescribed by a physician (self-purchased ‘over the counter’ treatment, e.g. ibuprofen)</td>
</tr>
<tr>
<td>• Temporarily stop spironolactone if diarrhoea and/or vomiting and contact physician</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem solving</th>
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</thead>
<tbody>
<tr>
<td><strong>Worsening renal function/hyperkalaemia:</strong></td>
</tr>
<tr>
<td>• See ‘How to use’</td>
</tr>
<tr>
<td>• Major concern is hyperkalaemia (≥ 6.0 mmol/litre) though this was uncommon in the RALES clinical trial; a potassium level at the higher end of the normal range may be desirable in patients with heart failure, particularly if taking digoxin</td>
</tr>
<tr>
<td>• Some ‘low salt’ substitutes have a high K+ content</td>
</tr>
<tr>
<td>• Male patients may develop breast discomfort and/or gynaecomastia (consider eplerenone as an alternative after specialist advice)</td>
</tr>
</tbody>
</table>

Adapted from *European Journal of Heart Failure* 2001, 3, 495-502 (McMurray et al. Practical recommendations for the use of ACE inhibitors, beta-blockers and spironolactone in heart failure: putting guidelines into practice), copyright (2001), with permission from European Society of Cardiology.
Appendix 4: Dizziness and falls in the patient on heart failure medication.

Falls and symptoms of dizziness are common in elderly patients and it is important to establish the cause prior to automatically discontinuing their heart failure medication. It is important to remember that in a patient with severe systolic dysfunction a systolic blood pressure of 80 mmHg may be quite appropriate providing the patient is asymptomatic and renal function is stable. The following should be addressed to guide management.

1. Did the falls or symptoms of dizziness precede the introduction of heart failure medication?
2. Does the patient report symptoms of postural hypotension (light headedness on standing) or symptoms of vertigo (room spinning)? Some patients may suffer from benign positional vertigo or vestibular disease which may present in a similar way to postural hypotension because the patient experiences vertigo on getting out of bed.
3. Has a postural blood pressure been measured? It is important to demonstrate a postural drop in blood pressure in conjunction with symptoms if the postural hypotension is to be confirmed. Asymptomatic hypotension is not an indication for withdrawal of heart failure medication.
4. Are other drugs responsible which could be discontinued first? Alpha blockers, calcium channel blockers, anti depressant or psychotropic medication.

When reducing heart failure medication as a result of postural hypotension please inform the community heart failure nurse or cardiologist responsible for the patient since this may prompt a change in approach to therapy e.g. consideration of cardiac resynchronisation pacing. It is also important to check that the symptoms resolve once heart failure medication is reduced or withdrawn, if not an alternative cause should be considered and their medication may be reintroduced.
Appendix 5 –

Referral to Oxfordshire Community Heart Failure Nursing Team

Referral Criteria

Patient with a confirmed diagnosis of heart failure, who would benefit from assessment and support by the community heart failure nursing team.

Patient education – self-monitoring - dietary measures including salt avoidance - monitoring fluid intake - smoking cessation – symptoms and signs of worsening heart failure - clinical assessment - psychological and social support - helping to implement drug treatments with appropriate monitoring to ensure full titration of recommended medications – prevention of hospital admission where possible - planning for the future and providing end of life care - close liaison with referring team and GP.

Inclusion

- Patients with Left Ventricular Systolic Dysfunction (LVSD) confirmed by echocardiogram or other cardiac image modality
- Patients with non-LVSD heart failure (diastolic HF, RHF, etc) who are already under the care of a cardiologist
- Must be registered at a GP practice encompassed by the Oxfordshire Primary Care Trusts. (Brackley and Byfield practices included also)

Exclusion

- Patients who have suffered an MI within the last three months unless already known to have LVSD
- Life expectancy at less than six months as a result of other illness

Please phone and discuss a referral first if you are uncertain whether the referral is appropriate. All referrals will be assessed on an individual basis.

Referral Process

There is not a referral form - referrals accepted by post/fax/phone. Please provide the following when referring a patient:
- Reason for referral
- Echo report if available
- Recent relevant clinic letters
- Up to date list of medications
- Patient summary (GP referrals)

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<tr>
<th>Oxford office</th>
<th>Banbury office</th>
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</thead>
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<tr>
<td>63 Blackbird Leys Road</td>
<td>Orchard Health Centre</td>
</tr>
<tr>
<td>Blackbird Leys</td>
<td>Cope Road</td>
</tr>
<tr>
<td>Oxford, OX4 6HL</td>
<td>Banbury</td>
</tr>
<tr>
<td>Tel: 01865 904006</td>
<td>Oxon, OX16 2EZ</td>
</tr>
<tr>
<td>Fax: 01865 337438</td>
<td>Tel: 01295 819170</td>
</tr>
<tr>
<td></td>
<td>Fax: 01295 819111</td>
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</table>

Email: Oxfordhealth.CommunityHeartFailure@nhs.net

If you are unsure which office to send the referral to, then please use the details for the Oxford office
Oxfordshire Community Heart Failure Nurse Service

Referral criteria for Community Heart Failure Nurse Specialist (CHFNS)
- Patients with Left Ventricular Systolic Dysfunction (LVSD) confirmed by echocardiogram or other cardiac image modality
- Patients with non-LVSD heart failure (diastolic HF, RHF, etc) who are already under the care of a cardiologist
- Registered at a GP practice encompassed by the Oxfordshire Primary Care Trust. (Brackley and Byfield practices included also)

Regular clinics currently held at:
Witney Community Hospital
Orchard Health Centre, Banbury
East Oxford Health Centre
The Health Centre, Wantage
Bicester Health Centre

Referral received from ORH, GP, outpatients, patient re-referral or other HCP

Priority order for seeing HF patients
- Hospital discharge LVSD and symptomatic HF
- GP/OPA LVSD and asymptomatic HF
- Re-referral LVSD with decompensation
- Unstable LVSD requiring review
- Stable LVSD for up-titration
- Non-LVSD heart failure patients
- Inappropriate referral – not HF

1st visit
- Assess extent of patient’s knowledge
- Explanation of term ‘heart failure’
- Educate to recognise signs of early deterioration and when to seek help
- Medication regime and adherence
- Tailored lifestyle advice
- Encourage greater level of self-care
- Clinical assessment
- Psychological support to patient/carer
- Concerns and/or questions

Management plan options
- Optimisation of medical therapy as required and tolerated (ongoing)
- Advice regarding appropriate blood chemistry monitoring (ongoing)
- Symptom management
- Referral to other services, i.e., palliative care, DN, etc

Liaise with GP/cardiologist using preferred method of communication to discuss management plan and implement changes.

Follow-up
- Follow up with patient by telephone, home visit, text, email or clinic appointment according to need
- Time frame of follow up will depend on status of patient
- Maintain close communication with patient’s GP
- Advice from cardiologist where appropriate

Discharge from service
- Optimum medical therapy achieved OR commenced ACE/BB and management plan in place for up-titration
- Haemodynamically stable
- Maximum symptom benefit achieved

Discharge letter to GP with recommended plan for future maintenance

5 day contact and 10 day visit dependent on priority order of patient and capacity of heart failure team
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