NHS

National Institute for Clinical Excellence

Chronic heart failure

Management of chronic heart failure in adults in primary and secondary care

Clinical Guideline 5

July 2003

Developed by the National Collaborating Centre for Chronic Conditions

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Issue date: July 2003

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Copies of this guideline can be ordered from the NHS Response Line; telephone 0870 1555 455 and quote reference number N0247. A version for people who want to understand what NICE has told the NHS, called *Management of Heart Failure. Understanding NICE Guidance – Information for People with Heart Failure, Their Carers, and the Public*, is also available from the Response Line; quote reference number N0248 for an English only version and N0249 for an English and Welsh version.

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This guidance is written in the following context:

This guidance represents the view of the Institute, which was arrived at after careful consideration of the evidence available. Health professionals are expected to take it fully into account when exercising their clinical judgment The guidance does not, however, override the individual responsibility of health professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

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Contents

Heart failure

Heart failure is a complex syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the heart to function as a pump to support a physiological circulation. The syndrome of heart failure is characterised by symptoms such as breathlessness and fatigue, and signs such as fluid retention.

This guideline offers best practice advice on the care of adult patients (aged 18 years or older) who have symptoms or a diagnosis of chronic heart failure. It aims to define the most effective combination of symptoms, signs and investigations required to establish a diagnosis of heart failure, and those which will influence therapy or provide important prognostic information. It also gives guidance on the treatment, monitoring and support of patients with heart failure.

Key recommendations

The following recommendations have been identified as priorities for implementation.

Diagnosis

1 The basis for historical diagnoses of heart failure should be reviewed, and only patients whose diagnosis is confirmed should be managed in accordance with this guideline.

2 Doppler 2D echocardiographic examination should be performed to exclude important valve disease, assess the systolic (and diastolic) function of the (left) ventricle and detect intracardiac shunts.

Treatment

3 All patients with heart failure due to left ventricular systolic dysfunction should be considered for treatment with an ACE inhibitor.

4 Beta blockers licensed for use in heart failure should be initiated in patients with heart failure due to left ventricular systolic dysfunction after diuretic and ACE inhibitor therapy (regardless of whether or not symptoms persist).

Monitoring

5 All patients with chronic heart failure require monitoring. This monitoring should include:
- a clinical assessment of functional capacity, fluid status, cardiac rhythm, and cognitive and nutritional status
- a review of medication, including need for changes and possible side effects
- serum urea, electrolytes and creatinine.

Discharge

6 Patients with heart failure should generally be discharged from hospital only when their clinical condition is stable and the management plan is optimised.

7 The primary care team, patient and carer must be aware of the management plan.

Supporting patients and carers

8 Management of heart failure should be seen as a shared responsibility between patient and healthcare professional.

The following guidance is evidence based. The grading scheme used for the recommendations (A, B, C, Good Practice Point [GPP], NICE) is described in Appendix A; a summary of the evidence on which the guidance is based is provided in the full guideline (see Section 5).

1 Guidance

1.1 Diagnosing heart failure

The full evaluation of heart failure is more than stating whether the syndrome is present or not; it requires consideration of the underlying abnormality of the heart, the severity of the syndrome, the aetiology, precipitating and exacerbating factors, identification of concomitant disease relevant to the management, and an estimation of prognosis. It is important to exclude other conditions that may masquerade as heart failure (see Table 1).

The recommendations for diagnosing heart failure are summarised in an algorithm (Figure 1) on page 5.

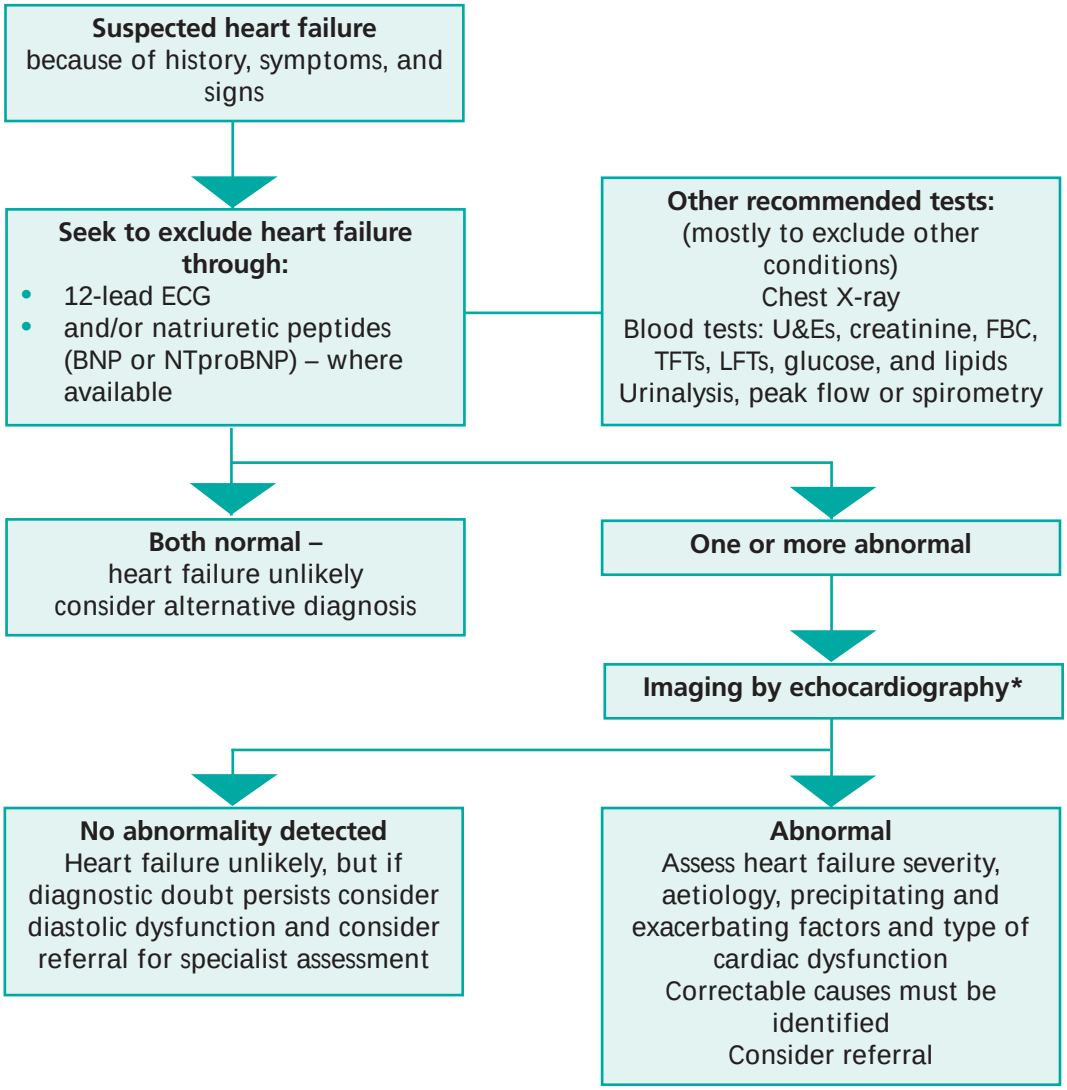
Table 1 Conditions presenting with similar symptoms

Other conditions that may present with similar symptoms	
• Obesity	• Hypoalbuminaemia
• Chest disease – including lung, diaphragm or chest wall	• Intrinsic renal or hepatic disease
• Venous insufficiency in lower limbs	• Pulmonary embolic disease
• Drug-induced ankle swelling (e.g. dihydropyridine calcium channel blockers)	• Depression and/or anxiety disorders
• Drug-induced fluid retention (e.g. NSAIDs)	• Severe anaemia or thyroid disease
	• Bilateral renal artery stenosis

1.1.1 Cardiac assessment

1.1.1.1 Take a careful and detailed history, and perform a clinical examination. These should be combined with tests to confirm the presence of heart failure and make a complete diagnosis. **GPP**

Figure 1 Algorithm summarising recommendations for the diagnosis of heart failure



* Alternative methods of imaging the heart should be considered when a poor image is produced by transthoracic Doppler 2D echocardiography – alternatives include transoesophageal Doppler 2D echocardiography, radionuclide imaging or cardiac magnetic resonance imaging

Key:

BNP	B-type natriuretic peptide
ECG	Electrocardiogram
FBC	Full blood count
LFTs	Liver function tests
NTproBNP	N-terminal pro-B-type natriuretic peptide
TFTs	Thyroid function tests
U&Es	Urea and electrolytes

1.1.1.2 Healthcare professionals should seek to exclude a diagnosis of heart failure through the following investigations: **B**

- 12-lead ECG
- and/or natriuretic peptides (BNP or NTproBNP) – where available.

If one or both are abnormal, a diagnosis of heart failure cannot be excluded and transthoracic Doppler 2D echocardiography should be performed because it consolidates the diagnosis and provides information on the underlying functional abnormality of the heart.

1.1.1.3 Efforts should be made to exclude other disorders that may present in a similar manner. **GPP**

1.1.1.4 To evaluate possible aggravating factors and/or alternative diagnoses the following tests are recommended. **GPP**

- Chest X-ray
- Blood tests:
  - biochemical profile including electrolytes, urea and creatinine
  - full blood count
  - thyroid function tests
  - liver function tests
  - fasting lipids
  - fasting glucose
- Urinalysis
- Peak flow or spirometry

1.1.1.5 Transthoracic Doppler 2D echocardiographic examination should be performed to exclude important valve disease, assess the systolic (and diastolic) function of the (left) ventricle, and detect intracardiac shunts. **GPP**

1.1.1.6 Transthoracic Doppler 2D echocardiographic studies should be performed on high-resolution equipment, by experienced operators trained to the relevant professional standards. Need and demand for these studies should not compromise quality. **GPP**

1.1.1.7 The reporting of echocardiography should be by those experienced in doing so. **GPP**

1.1.1.8 Alternative methods of imaging the heart should be considered when a poor image is produced by echocardiography. Such methods may include radionuclide angiography, cardiac magnetic resonance imaging, or transoesophageal Doppler 2D echocardiography. **B**

1.1.2 Diastolic heart failure

1.1.2.1 Where the diagnosis is unclear, or if a diagnosis of diastolic heart failure is being considered, the patient should be referred for more specialist assessment. **GPP**

1.1.3 Review of existing diagnoses

1.1.3.1 The basis for historical diagnoses of heart failure should be reviewed, and only patients whose diagnosis is confirmed should be managed in accordance with this guideline. **GPP**

1.1.3.2 If the diagnosis of heart failure is still suspected, but confirmation of the underlying cardiac abnormality has not occurred, then the patient should have appropriate further investigation. **GPP**

1.2 Treating heart failure

Treatments are available that can improve the life expectancy and quality of life of a person with heart failure. Treatment recommendations are given below, and include aspects of lifestyle, pharmacological therapy, and invasive procedures. It is also helpful to consider the need to keep patients fully informed about their condition and the treatment options, and this is reflected in the recommendations.

1.2.1 Lifestyle

Exercise training and rehabilitation

1.2.1.1 Patients with heart failure should be encouraged to adopt regular aerobic and/or resistive exercise. This may be more effective when part of an exercise programme or a programme of rehabilitation. **B**

Smoking

1.2.1.2 Patients must be strongly advised not to smoke. Referral to smoking cessation services should be considered. **GPP**

Alcohol

1.2.1.3 Patients with alcohol-related heart failure should abstain from drinking alcohol. **C**

1.2.1.4 Healthcare professionals should discuss alcohol consumption with the patient and tailor their advice appropriately to the clinical circumstances. **GPP**

Sexual activity

1.2.1.5 Healthcare professionals should be prepared to broach sensitive issues with patients, such as sexual activity, as these are unlikely to be raised by the patient. **GPP**

Vaccination

1.2.1.6 Patients with heart failure should be offered an annual vaccination against influenza. **GPP**

1.2.1.7 Patients with heart failure should be offered vaccination against pneumococcal disease (only required once). **GPP**

Air travel

1.2.1.8 Air travel will be possible for the majority of patients with heart failure, depending on their clinical condition at the time of travel. **GPP**

Driving regulations

1.2.1.9 Heavy Goods Vehicle and Public Service Vehicle licence: physicians should be up to date with the latest Driver and Vehicle Licensing Authority guidelines. Check the website for regular updates: www.dvla.gov.uk/ **GPP**

1.2.2 Pharmacological therapy for patients with heart failure due to left ventricular systolic dysfunction.

Drug therapy is required for the vast majority of patients with heart failure. It is the responsibility of the individual prescriber to check the dosage of medication. This document should be read as a guide to treatment rather than being considered a protocol that must be followed prescriptively in all patients. Treatment should be tailored to the individual patient, with referral for more specialist advice being considered where appropriate.

Note that at the time of issue of this guideline, the following drugs in this guideline are unlicensed in the UK for the treatment of heart failure or its common signs or symptoms.

- angiotensin II receptor antagonists
- the positive inotropic agent dobutamine
- calcium channel blockers.

Recommendations on specific drugs

Recommendations for pharmacological therapy for patients with heart failure due to left ventricular systolic dysfunction are summarised in the algorithm on page 10.

Diuretics

1.2.2.1 Diuretics (see Appendix D, Table A) should be routinely used for the relief of congestive symptoms and fluid retention in patients with heart failure, and titrated (up and down) according to need following the initiation of subsequent heart failure therapies. **C**

Angiotensin converting enzyme (ACE) inhibitors

1.2.2.2 All patients with heart failure due to left ventricular systolic dysfunction should be considered for treatment with an ACE inhibitor (see Appendix D, Table B). **A**

1.2.2.3 ACE inhibitor therapy should be instituted in patients with heart failure due to left ventricular systolic dysfunction before beta-blockade is introduced. **A**

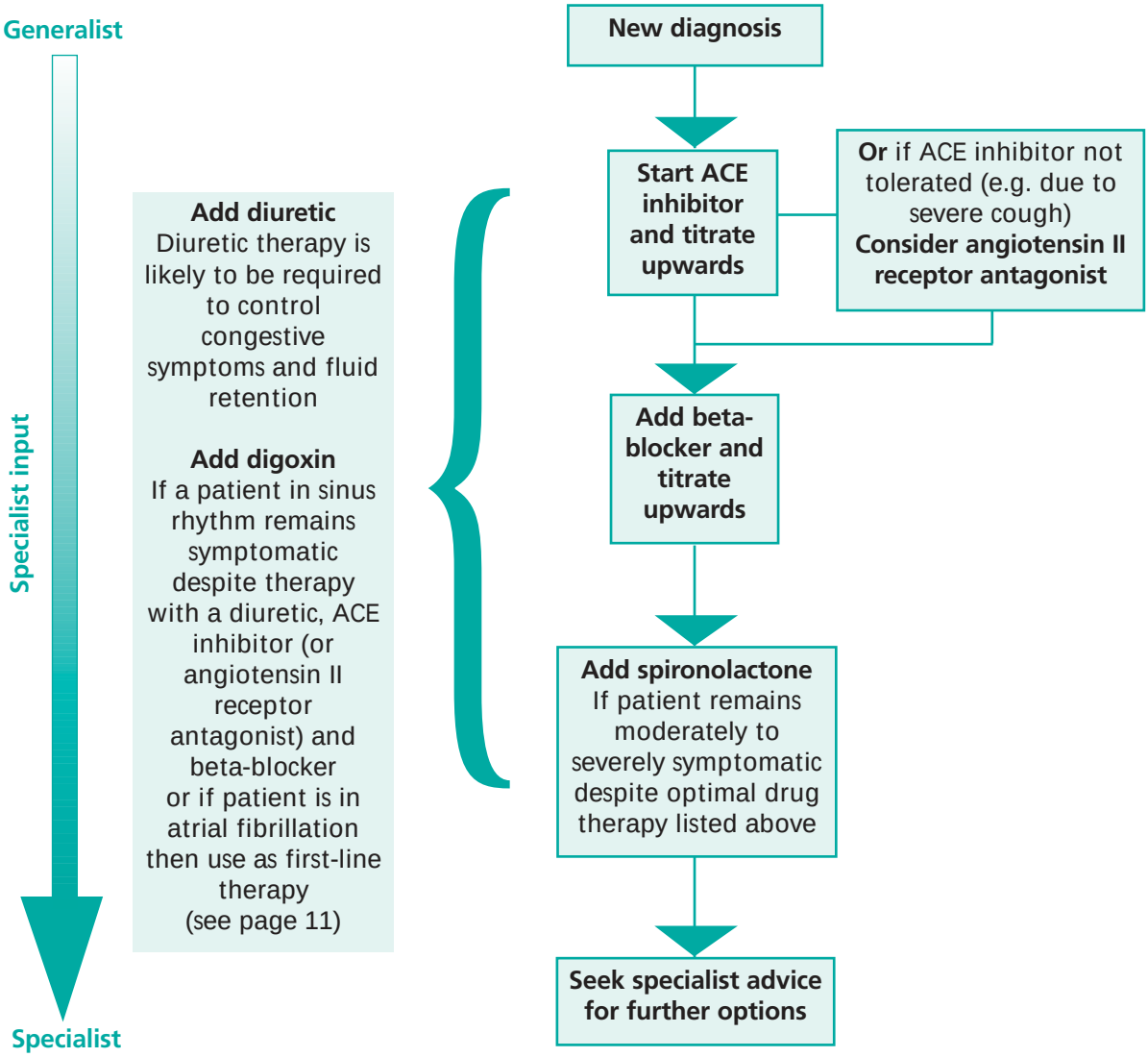
1.2.2.4 ACE inhibitor therapy should be initiated at the appropriate dose (see Appendix D, Table B), and titrated upwards at short intervals (for example, every 2 weeks) until the optimal tolerated or target dose is achieved. **GPP**

Figure 2 Algorithm for the pharmacological treatment of symptomatic heart failure due to left ventricular systolic dysfunction

Patients with symptomatic heart failure due to left ventricular systolic dysfunction should be treated with the following drugs (if tolerated and not contraindicated) and in the sequence indicated. The reader must refer to the text of the guideline for more detailed discussion and explanation.

Please note:

- Diuretic is first-line therapy when a patient presents with acute pulmonary oedema
- Please refer to Appendix D for starting doses of drugs
- The arrow on the left-hand margin indicates the increasing likelihood of the need for specialist input.



1.2.2.5 Blood biochemistry (urea, creatinine and electrolytes) should be measured after initiation and at each dose increment. **GPP**

Beta-blockers

1.2.2.6 Beta-blockers licensed for use in heart failure should be initiated in patients with heart failure due to left ventricular systolic dysfunction after diuretic and ACE inhibitor therapy (regardless of whether or not symptoms persist). See Appendix D, Table C. **A**

1.2.2.7 Beta-blockade therapy for heart failure should be introduced in a 'start low, go slow' manner, with assessment of heart rate, blood pressure, and clinical status after each titration. **C**

1.2.2.8 Patients who develop heart failure due to left ventricular systolic dysfunction and who are already on treatment with a beta-blocker for a concomitant condition (for example, angina, hypertension) should continue with a beta-blocker – either their current beta-blocker or an alternative licensed for heart failure treatment. **GPP**

Aldosterone antagonists

1.2.2.9 Patients with heart failure due to left ventricular systolic dysfunction who remain moderately to severely symptomatic despite optimal therapy (as outlined in the algorithm) should be prescribed spironolactone at a dose of 12.5 to 50 mg once per day (see Appendix D, Table D) – specialist advice should be sought. **A**

1.2.2.10 Patients with heart failure taking spironolactone should have blood potassium and creatinine levels monitored for signs of hyperkalaemia and/or deteriorating renal function.* If hyperkalaemia is a problem then the dose of spironolactone should be halved and biochemistry rechecked. **GPP**

*See Section 1.3, page 17 for further details

Digoxin

1.2.2.11 Digoxin is recommended for:

- worsening or severe heart failure due to left ventricular systolic dysfunction despite ACE inhibitor, beta-blocker and diuretic therapy **A**
- patients with atrial fibrillation and any degree of heart failure. **C**

Angiotensin II receptor antagonists

1.2.2.12 At the time of issue of this guideline, angiotensin II receptor antagonists (Appendix D, Table E) are not licensed in the UK for heart failure and studies are ongoing. However, angiotensin II receptor antagonists may provide an alternative to ACE inhibitors for patients intolerant of ACE inhibitors (for example, because of cough). **A**

1.2.2.13 The triple combination of ACE inhibitor, beta-blocker and angiotensin II receptor antagonist should be avoided, pending the results of further trials. **GPP**

Amiodarone

1.2.2.14 The decision to prescribe amiodarone should be made in consultation with a specialist. **GPP**

1.2.2.15 The need to continue the prescription should be reviewed regularly. **GPP**

1.2.2.16 Patients taking amiodarone should have a routine 6-monthly clinical review, including liver and thyroid function test, and including a review of side effects. **GPP**

Anticoagulants

1.2.2.17 Anticoagulation is indicated for patients with the combination of heart failure and atrial fibrillation (see also page 16). **A**

1.2.2.18 In patients with heart failure in sinus rhythm, anticoagulation should be considered for those with a history of thromboembolism, left ventricular aneurysm, or intracardiac thrombus. **GPP**

Aspirin

1.2.2.19 Aspirin (75–150 mg once daily) should be prescribed for patients with the combination of heart failure and atherosclerotic arterial disease (including coronary heart disease). **B**

Statins (hydroxymethylglutaryl-coenzyme A reductase inhibitors)

1.2.2.20 Patients with the combination of heart failure and known atherosclerotic vascular disease should receive statins only in accordance with current indications. Specific trials in this area are ongoing. **GPP**

Isosorbide/hydralazine combination (specialist initiation only)

1.2.2.21 An isosorbide/hydralazine combination may be used in patients with heart failure who are intolerant of ACE inhibitors or angiotensin II receptor antagonists. **A**

Inotropic agents (specialist use only)

1.2.2.22 Intravenous inotropic agents (such as dobutamine, milrinone or enoximone) should only be considered for the short-term treatment of acute decompensation of chronic heart failure. This will require specialist advice. **A**

Calcium channel blockers

1.2.2.23 Amlodipine should be considered for the treatment of co-morbid hypertension and/or angina in patients with heart failure, but verapamil, diltiazem or short-acting dihydropyridine agents should be avoided. **A**

Major co-morbidities that impact on the pharmacological management of heart failure

The presence of certain co-morbidities may affect the drugs that can be used for the treatment of heart failure, or increase the likelihood of side effects. The major co-morbidities that impact on the management of heart failure are summarised in Appendix D, Table F.

Side effects of drugs commonly used in the treatment of heart failure

All drugs have side effects. See the Summary of Product Characteristics for individual drugs for details.

Improving adherence to pharmacological therapy

1.2.2.24 Dosing regimens should be kept as simple as possible, and the healthcare professional should ensure that the patient and carer are fully informed about their medication. **B**

1.2.3 Invasive procedures

Although drug therapy is the mainstay of treatment of heart failure, some patients will also benefit from diagnostic or interventional invasive procedures. These procedures are normally organised by a specialist. This guideline can only give general advice, and specialist advice is strongly recommended where such procedures might be considered.

Coronary revascularisation

1.2.3.1 Coronary revascularisation should not be routinely considered in patients with heart failure due to systolic left ventricular impairment, unless they have refractory angina. **C**

Cardiac transplantation

1.2.3.2 Specialist referral for transplantation should be considered in patients with severe refractory symptoms or refractory cardiogenic shock. **C**

Cardiac resynchronisation therapy

1.2.3.3 Resynchronisation therapy should be considered in selected patients with left ventricular systolic dysfunction (left ventricular ejection fraction ≤ 35%), drug refractory symptoms, and a QRS duration > 120 ms. The results of ongoing trials will help guide appropriate patient selection. **A**

Implantable cardioverter-defibrillators (ICDs)

1.2.3.4 Recommendation from *NICE Technology Appraisal Guidance No. 11*, Guidance on the use of implantable cardioverter defibrillators for arrhythmias (see Section 6, page 25). **NICE 2000**

The use of implantable cardioverter defibrillators (ICDs) should be routinely considered for patients in the following categories:

1. Secondary prevention, that is for patients who present, in the absence of a treatable cause, with:

   - cardiac arrest due to either ventricular tachycardia (VT) or ventricular fibrillation
   - spontaneous sustained VT causing syncope or significant haemodynamic compromise
   - sustained VT without syncope/cardiac arrest, and who have an associated reduction in ejection fraction (less than 35%) but are no worse than Class III* of the New York Heart Association functional classification of heart failure.

2. 'Primary prevention' for patients with:

- a history of previous myocardial infarction and all of the following:

  i) non-sustained VT on Holter (24-hour ECG) monitoring

  ii) inducible VT on electrophysiological testing

  iii) left ventricular dysfunction with an ejection fraction less than 35% and no worse than Class III* of the New York Heart Association functional classification of heart failure.

- A familial cardiac condition with a high risk of sudden death, including long QT syndrome, hypertrophic cardiomyopathy, Brugada syndrome, arrhythmogenic right ventricular dysplasia and following repair of tetralogy of Fallot.

*Marked limitation of physical activity. Although patients are comfortable at rest, less than ordinary physical activity will lead to symptoms (symptomatically 'moderate' heart failure)

1.2.4 Oxygen therapy and continuous airway pressure

The evidence for oxygen therapy and continuous positive airway pressure was considered during development of this guideline, but it was not possible to make specific recommendations because of the small evidence base. For further details, see the full guideline (see Section 5).

1.2.5 Recommendations for treatment of heart failure *not* due to left ventricular systolic dysfunction

Valve disease

C

1.2.5.1 Patients with heart failure due to valve disease should be referred for specialist assessment and advice regarding follow-up.

C

1.2.5.2 ACE inhibitor therapy should not be initiated in a patient with a clinical suspicion of haemodynamically significant valve disease, until the valve disease has been assessed by a specialist.

Diastolic dysfunction

1.2.5.3 The diagnosis and treatment of diastolic dysfunction should be made by a specialist, and other conditions that present in a similar way may need to be considered. Patients in whom this diagnosis has been made should usually be treated with a low to medium dose of loop diuretics (for example, less than 80 mg furosemide per day). Patients who do not respond to this treatment will require further specialist advice. **GPP**

Other causes

The management of other causes of heart failure requires specialist input. This would include congenital heart disease, cardiomyopathies, and specific heart muscle disease such as amyloid.

1.2.6 Recommendations for patients with heart failure and atrial fibrillation

1.2.6.1 For patients with heart failure and atrial fibrillation, specialist advice should be sought as to whether the aim is improvement of heart rate control or cardioversion (return to sinus rhythm). **C**

1.2.6.2 Anticoagulation is indicated for patients with heart failure and atrial fibrillation (see also anticoagulation section, page 12). **A**

1.2.7 Recommendations for different subgroups of patients with heart failure

Age

1.2.7.1 The management of heart failure should be determined by clinical criteria, irrespective of the age of the patient. **A**

1.2.7.2 Tolerance of drugs may be lower and side effects require closer and more frequent monitoring in older patients. **GPP**

Gender

1.2.7.3 The principles of pharmacological management of heart failure should be the same for men and women. **GPP**

1.2.7.4 The potential teratogenic effects of drugs should be considered. **GPP**

Pregnancy

1.2.7.5 In women of reproductive age who have heart failure, contraception and pregnancy should be discussed. If pregnancy is being considered or occurs, specialist advice should be sought. Subsequently, specialist care should be shared between the cardiologist and obstetrician. **GPP**

Ethnicity

1.2.7.6 The principles of pharmacological management should be the same for all patients with heart failure, regardless of ethnicity. **GPP**

1.3 Monitoring

The clinical condition of a person with heart failure may fluctuate and repeated admission to hospital is common, particularly for patients with more severe heart failure. Monitoring of clinical status is necessary and will involve healthcare professionals in both primary and secondary care. Patients and their carers are playing an increasing role in monitoring, but this requires appropriate education and support.

1.3.1 Clinical review

1.3.1.1 All patients with chronic heart failure require monitoring. This monitoring should include (see Table 2, page 18): **GPP**

- a clinical assessment of functional capacity, fluid status, cardiac rhythm (minimum of examining the pulse), cognitive status and nutritional status
- a review of medication, including need for changes and possible side effects
- serum urea, electrolytes and creatinine *.

* This is a minimum. Patients with co-morbidities or co-prescribed medications will require further monitoring. Monitoring serum potassium is particularly important if a patient is taking digoxin or spironolactone.

1.3.1.2 More detailed monitoring will be required if the patient has significant co-morbidity or has deteriorated since the previous review. **GPP**

1.3.1.3 The frequency of monitoring should depend on the clinical status and stability of the patient. The monitoring interval should be short (days to 2 weeks) if the clinical condition or medication has changed, but is required at least 6 monthly for stable patients with proven heart failure. **GPP**

1.3.1.4 Patients who wish to be involved in monitoring of their condition should be provided with sufficient education and support from their healthcare professional to do this, with clear guidelines as to what to do in the event of deterioration. **GPP**

1.3.2 Therapeutic drug monitoring of serum digoxin concentrations

1.3.2.1 Routine monitoring of serum digoxin concentrations is not recommended. A digoxin concentration measured within 8–12 hours of the last dose may be useful to confirm a clinical impression of toxicity or non-compliance. **GPP**

1.3.2.2 The serum digoxin concentration should be interpreted in the clinical context as toxicity may occur even when the concentration is within the 'therapeutic range'. **GPP**

Table 2 Assessments to be made at clinical review

Assessment of functional capacity	Chiefly from history, but more objectively by use of New York Heart Association class, specific quality-of-life questionnaires, 6-minute walk test, or maximal exercise test. Note: not all of these tests are likely to be necessary, or appropriate, at each assessment.
Assessment of fluid status	Chiefly by physical examination – changes in body weight, extent of jugular venous distension, lung crackles and hepatomegaly, extent of peripheral oedema, and lying and standing blood pressure (postural drop in blood pressure may indicate hypovolaemia)
Assessment of cardiac rhythm	Chiefly by clinical examination, but may require 12-lead electrocardiogram (ECG) or 24-hour electrocardiographic ('Holter') monitoring if suspicion of arrhythmia
Laboratory assessment	Checking of serum biochemistry (urea, electrolytes, creatinine) is essential, but other tests (such as thyroid function, haematology, liver function, level of anticoagulation) may also be required depending on the medication prescribed and co-morbidity

1.4 Referral and approach to care

The management of heart failure is likely to be shared between healthcare professionals in both primary and secondary care. Patients and their carers are increasingly involved in management decisions. Work with patient focus groups suggests that the major failings of management relate to poor communication between healthcare professionals, and between patients and the professionals caring for them.

1.4.1 Referral for more specialist advice

1.4.1.1 Patients with heart failure require specialist advice in the following situations. **GPP**

- Heart failure due to valve disease, diastolic dysfunction or any other cause except left ventricular systolic dysfunction.
- One or more of the co-morbidities outlined in Appendix D, Table F.
- Angina, atrial fibrillation or other symptomatic arrhythmia.
- Women who are planning a pregnancy or who are pregnant.

1.4.1.2 The following situations also require referral. **GPP**

- Severe heart failure.
- Heart failure that does not respond to treatment as discussed in this guideline and outlined in the algorithm.
- Heart failure that can no longer be managed effectively in the home setting.

1.4.2 Discharge planning

1.4.2.1 Patients with heart failure should generally be discharged from hospital only when their clinical condition is stable and the management plan is optimised. Timing of discharge should take into account patient and carer wishes, and the level of care and support that can be provided in the community. **GPP**

1.4.2.2 The primary care team, patient and carer must be aware of the management plan. **GPP**

1.4.2.3 Clear instructions should be given as to how the patient/carer can access advice particularly in the high-risk period immediately following discharge. **GPP**

1.4.3 Multidisciplinary team approach to heart failure management

1.4.3.1 Heart failure care should be delivered by a multidisciplinary team with an integrated approach across the healthcare community. **A**

1.4.4 Non-NHS agencies

1.4.4.1 Standard One of The Older People NSF states:
Social care services will not use age in their eligibility criteria or policies to restrict access to available services. This applies to patients with heart failure. (See www.doh.gov.uk/nsf/olderpeople.htm) **GPP**

1.4.4.2 Management plans for patients with heart failure should be discussed with non-NHS agencies where they are involved in or responsible for the care of a person with heart failure. **GPP**

1.4.4.3 The principles of pharmacological management for a patient cared for in a non-NHS institution should be similar to those for any other patient with heart failure. **GPP**

1.4.4.4 The education needs of non-NHS agency carers should be considered. **GPP**

1.5 Supporting patients and carers

Understanding the information needs of patients and carers is vital. Key issues identified by patient focus groups include the importance of honesty and accurate information, and the potential value of support groups. The recommendations below are based on earlier consensus guidelines produced by a Royal College of Physicians' working party.

1.5.1 Communication

1.5.1.1 Good communication between healthcare professionals and patients and carers is essential for the best management of heart failure. **GPP**

1.5.1.2 Guidelines for good communication. **C**

- Listen to patients and respect their views and beliefs.
- Give patients the information they ask for or need about their condition, its treatment and prognosis, in a way they can understand, including information about any serious side effects of drugs to be prescribed.
- Provide the most important information first.
- Explain how each item will affect patients personally.
- Present information in separate categories.
- Make advice specific, detailed and concrete.
- Use words the patients will understand; confirm understanding by questions; define unfamiliar words; write down key words; draw diagrams and keep a copy in the medical notes.
- Repeat the information using the same words each time.
- Prepare material, written or taped, to back up handwritten notes.
- Share information with patients' partners, close relatives or carers if they ask you to do so. When patients cannot indicate their consent for such sharing of information, it is advisable to share the information that those close to the patient need or want to know, except where you have reason to believe that the patient would object if able to do so.

1.5.1.3 The content, style and timing of information provision should be tailored to the needs of the individual patient. **C**

1.5.1.4 Healthcare professionals should assess cognitive ability when sharing information. **GPP**

1.5.1.5 Carers and relatives of patients who are cognitively impaired should be made aware of treatment regimens for the patients they care for and be encouraged to identify any need for clinical support. **GPP**

1.5.1.6 Management of heart failure should be seen as a shared responsibility between patient and healthcare professional. **GPP**

1.5.1.7 Unless specifically excluded by the patient, carers and relatives should be involved in the management of the patient, particularly where the patient cannot look after him- or herself. **GPP**

1.5.2 Prognosis

1.5.2.1 Prognosis should be discussed with patients and carers in a sensitive, open and honest manner. **GPP**

1.5.3 Support groups

1.5.3.1 Healthcare professionals should be aware of local cardiac support networks and provide this information to patients and carers. **GPP**

1.6 Anxiety and depression

Depression tends to be more common in patients with heart failure than in the general population. Drug therapy with antidepressants may lead to complications such as fluid retention, hypotension and arrhythmias.

1.6.1.1 The diagnosis of depression should be considered in all patients with heart failure. **C**

1.6.1.2 Where depression is likely to have been precipitated by heart failure symptoms then reassessment of psychological status should be undertaken once the physical condition has stabilised following treatment for heart failure. If the symptoms have improved no further specific treatment for depression is required. **C**

1.6.1.3 Where it is apparent that depression is co-existing with heart failure, then the patient should be treated for depression following the NICE guideline (Depression: the management of depression in primary and secondary care), scheduled for publication in February 2004. **C**

1.6.1.4 For patients with heart failure, the potential risks and benefits of drug therapies for depression should be considered carefully. **GPP**

1.6.1.5 Patients with heart failure should consult a healthcare professional before using over-the-counter therapies for depression such as St John's wort (*Hypericum perforatum*). Healthcare professionals should be aware of the potential interaction with prescribed medication, and always ask about self-medication, including the use of herbal products. **GPP**

1.7 End of life issues

There is substantial evidence for considerable unmet palliative needs of patients with heart failure and their informal carers. The main areas of need include symptom control, psychological and social support, planning for the future, and end of life care. **GPP**

1.7.1.1 Issues of sudden death and living with uncertainty are pertinent to all patients with heart failure. The opportunity to discuss these issues should be available at all stages of care. **GPP**

1.7.1.2 The palliative needs of patients and carers should be identified, assessed and managed at the earliest opportunity. **GPP**

1.7.1.3 Patients with heart failure and their carers should have access to professionals with palliative care skills within the heart failure team. **GPP**

2 Notes on the scope of the guidance

All NICE guidelines are developed in accordance with a scope document that defines what the guideline will and will not cover. The scope of this guideline was established at the start of the development of this guideline, following a period of consultation; it is available from: www.nice.org.uk/docref.asp?d=22427

The guideline covers the care provided by primary and secondary healthcare professionals who have direct contact with, and make decisions concerning, the care of patients with heart failure. It also addresses issues concerning the interface between primary and secondary care, including in what circumstances patients should be referred to or admitted to secondary care.

The guideline addresses all the key areas of managing chronic heart failure, including diagnosis, and pharmacological and non-pharmacological treatments.

This guideline does not include specific reference to 'acute' heart failure, but does include comment on exacerbation of the syndrome and the causes and treatment of this, recognising that chronic heart failure often has an undulating course. It does not address the screening or diagnosis of people who are asymptomatic, the management of patients with right heart failure as a consequence of respiratory disease, or post-transplant care. In addition, the guideline does not cover the organisational aspects of heart failure management. It does not therefore address models of care, the roles or composition of primary or secondary healthcare teams and competencies, skill mix or training requirements.

This guideline was developed for the NHS, and although it comments on the interface with other sectors, it does not consider them in detail.

3 Implementation in the NHS

3.1 In general

Local health communities should review their existing service provision for the management of heart failure against this guideline as they develop their Local Delivery Plans. The review should consider the resources required to implement fully the recommendations set out in Section 1 of this guideline, the people and processes involved, and the timeline over which full implementation is envisaged. It is in the interests of patients that the implementation timeline is as rapid as possible.

Relevant local clinical guidelines and protocols should be reviewed in the light of this guidance and revised accordingly.

3.2 Audit

Suggested audit criteria are listed in Appendix E.

4 Research recommendations

Research recommendations have been identified during the development of this guideline. They are detailed in the full guideline (see Section 5).

5 Full guideline

The National Institute for Clinical Excellence commissioned the development of this guidance from the National Collaborating Centre for Chronic Conditions. The Centre established a Guideline Development Group (see Appendix B), which reviewed the evidence and developed the recommendations.

The full guideline, *Chronic Heart Failure: Management of Chronic Heart Failure in Adults in Primary and Secondary Care*, is published by the National Collaborating Centre for Chronic Conditions; it is available on its website (www.rcplondon.ac.uk/college/ceeu/ncccc_index.htm), the NICE website (www.nice.org.uk) and on the website of the National Electronic Library for Health (www.nelh.nhs.uk).

The members of the Guideline Development Group are listed in Appendix B. Information about the Institute's Guideline Review Panel is given in Appendix C.

The booklet *The Guideline Development Process – Information for the Public and the NHS* has more information about the Institute's guideline development process. It is available from the Institute's website and copies can also be ordered by telephoning 0870 1555 455 (quote reference N0038).

6 Related NICE guidance

National Institute for Clinical Excellence (2000). Guidance on the use of implantable cardioverter defibrillators for arrhythmias. *NICE Technology Appraisal Guidance No. 11*. London: National Institute for Clinical Excellence. Available from: www.nice.org.uk/Docref.asp?d=10239

7 Review date

The process of reviewing the evidence is expected to begin 4 years after the date of issue of this guideline (July 2007). Reviewing may begin earlier than 4 years if significant evidence that affects the guideline recommendations is identified sooner. The updated guideline will be available within 2 years of the start of the review process.

A version of this guideline for patients with heart failure, their carers and the public is available from the NICE website (www.nice.org.uk) or from NHS Response Line (0870 1555 455; quote reference number N0248 for an English version and N0249 for an English and Welsh version)

Appendix A: Grading scheme

The grading scheme and hierarchy of evidence used in this guideline are shown in the table below.

Hierarchy of evidence		Typical grading of recommendations	
Level	**Type of evidence**	**Grade**	**Evidence**
Ia	Evidence obtained from systematic review of meta-analysis of randomised controlled trials	A	At least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation (evidence levels Ia and Ib)
Ib	Evidence obtained from at least one randomised controlled trial		
IIa	Evidence obtained from at least one well-designed controlled study without randomisation	B	Well-conducted clinical studies but no randomised clinical trials on the topic of recommendation (evidence levels IIa, IIb, III)
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study		
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies		
IV	Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities	C	Expert committee reports or opinions and/or clinical experience of respected authorities. This grading indicates that directly applicable clinical studies or good quality are absent (evidence level IV)
		GPP	Recommended good practice based on the clinical experience of the Guideline Development Group
DS	Evidence from diagnostic studies	DS	Evidence from diagnostic studies
NICE	Evidence from NICE guidelines or health technology appraisal programme	NICE	Evidence from NICE guidelines or health technology appraisal programme

Adapted from: National Institute for Clinical Excellence (2001). *The Guideline Development Process – Information for National Collaborating Centres and Guideline Development Groups.* London: National Institute for Clinical Excellence. Available from www.nice.org.uk.

Appendix B: The Guideline Development Group

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General Practitioner, Christchurch

Mr Steven Barnes
Health Services Research Fellow in Guideline Development, National Collaborating Centre for Chronic Conditions

Professor Martin Cowie (Clinical Advisor)
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Ms Stephanie Cruickshank
Heart failure patient and carer representative; Cardiomyopathy Nurse Specialist, St George's Hospital, London

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Senior Lecturer in Cardiology, St George's Hospital Medical School, London

Professor Rose Anne Kenny
Professor of Geriatric Medicine, University of Newcastle

Dr Jonathan Mant (Lead)
Senior Lecturer in Public Health, University of Birmingham

Mr Derrick Masters
Heart failure patient and carer representative

Dr Jennifer Roberts
Senior Lecturer in Health Economics, School of Health and Related Research, University of Sheffield

Professor Mojgan Sani
Consultant Pharmacist, Guys' and St Thomas' Hospital Trust and Visiting Professor, School of Pharmacy and Pharmacology, University of Bath

Ms Hasina Shaikh
Information scientist, National Collaborating Centre for Chronic Conditions

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Consultant Cardiologist, Leeds General Infirmary

Dr Ann Taylor
Chartered Physiotherapist, School of Biomedical Sciences, King's College London; Research Officer, Association of Chartered Physiotherapists in Cardiac Rehabilitation

Ms Sarah Williams
Project manager, National Collaborating Centre for Chronic Conditions

Consensus reference group (CRG)

To support the development of this guideline, a Consensus Reference Group (CRG) was formed. The CRG met early in the development process to ensure that the aims and the clinical questions addressed by the guideline were appropriate. The CRG met again at the end of the process to review the recommendations drafted by the Guideline Development Group. The group used formal consensus techniques in their consideration of clinically important areas where there was insufficient evidence or disagreement over the interpretation of the evidence.

Professor John Camm (Chair)
President, British Cardiac Society; Professor of Cardiology, St George's Hospital Medical School, London

Professor John Cleland
Professor of Academic Cardiology, University of Hull

Dr Michael Gammage
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External Professor of Primary Care, University of Glamorgan

Dr David Roberts
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Dr Chris Spencer-Jones
Director of Public Health, Dudley Health Authority

* Attended and contributed to at least one GDG meeting

Appendix C: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring its quality. The Panels include experts on guideline methodology, health professionals and people with experience of the issues affecting patients and carers. The members of the Guideline Review Panel for this guideline were as follows.

Dr Bernard Higgins (Chair)
Consultant Chest Physician
Freeman Hospital
Newcastle upon Tyne

Dr Robert Higgins
Consultant in Renal and General Medicine
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Dr Marcia Kelson
Director
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Dr Peter Rutherford
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Dame Helena Shovelton
Chief Executive
British Lung Foundation

Fiona Wise
Acting Director of Modernisation
Bedfordshire and Hertfordshire Strategic Health Authority

Dr John Young
Medical Director
Merck Sharp and Dohme

Appendix D: Further information on pharmacological treatment

Table A Diuretics (oral): dosages and side effects

Drug	Initial dose (mg)		Maximum recommended daily dose (mg)	
Loop diuretics				
Bumetanide	0·5–1·0		5–10	
Furosemide	20–40		250–500	
Torasemide	5–10		100–200	
Thiazides*				
Bendroflumethiazide (previously called bendrofluazide)	2.5		5	
Indapamide	2·5		2·5	
Metolazone	2·5		10	
Potassium-sparing diuretics	**+ACEI**	**–ACEI**	**+ACEI**	**–ACEI**
Amiloride	2·5	5	20	40
Triamterene	25	50	100	200

For **spironolactone**, see page 9
ACEI, angiotensin converting enzyme inhibitor

*May be effective when added to loop diuretics when fluid retention is resistant, but can promote dramatic diuresis and disturbance in fluid balance and electrolytes. Patient must be closely monitored and specialist advice is required

Table B Practical recommendations on the use of ACE inhibitors

Which ACE inhibitor and what dose?

Licensed ACEI	Starting dose (mg)	Target dose (mg)
Captopril	6.25 three times daily	50–100 three times daily
Cilazapril*	0.5 once daily	1–2.5 once daily
Enalapril	2.5 twice daily	10–20 twice daily
Fosinopril*	10 once daily	40 once daily
Lisinopril	2.5–5.0 once daily	30–35 once daily
Perindopril*	2.0 once daily	4 once daily
Quinapril*	2.5–5.0 once daily	10–20 once daily
Ramipril	2.5 once daily	5 twice daily or 10 once daily

*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

- 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).

Continued

Which ACE inhibitor and what dose? *Continued*

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.

Table C Practical recommendations on the use of beta-blockers

Which beta-blocker and what dose?
Which beta-blocker and what dose? Only two beta-blockers are licensed for the treatment of heart failure in the UK at the time of issue of this guideline. **Starting dose (mg)** / **Target dose (mg)** Bisoprolol: 1.25 once daily / 10 once daily Carvedilol: 3.125 twice daily / 25–50 twice daily* * 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-titrate/stop up-titration, 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-titration 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 beta-blocker (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 *Continued*

Which beta-blocker and what dose? *Continued*

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.

Table D Practical recommendations for the use of spironolactone

Which dose of spironolactone?
Dose (mg) 12.5–25 daily * * 50 mg may be advised by a specialist if heart failure deteriorates and no problem with hyperkalaemia
How to use • Start at 25 mg once daily • Check blood chemistry at: 1, 4, 8 and 12 weeks; 6, 9 and 12 months; 6 monthly thereafter • 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 • If K^+ rises to ≥ 6.0 mmol/litre or creatinine to > 200 µmol/litre stop spironolactone and seek specialist advice
Advice to patient • Explain expected benefits • Treatment is given to improve symptoms, prevent worsening of heart failure and to increase survival • Symptom improvement occurs within a few weeks to a few months of starting treatment • Avoid NSAIDs not prescribed by a physician (self-purchased 'over the counter' treatment, e.g. ibuprofen) • Temporarily stop spironolactone if diarrhoea and/or vomiting and contact physician
Problem solving ***Worsening renal function/hyperkalaemia:*** • See 'How to use' • 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 • Some 'low salt' substitutes have a high K^+ content • Male patients may develop breast discomfort and/or gynaecomastia
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.

Table E Currently available angiotensin II receptor antagonists

Drug*	Daily dose (mg)
Candesartan	4–16
Eprosartan	400–800
Irbesartan	150–300
Losartan	50–100
Telmisartan	40–80
Valsartan	80–320

*None of these drugs is currently licensed for the treatment of heart failure in the UK

Table F Major co-morbidities that impact on the management of heart failure

Co-morbidity	Comments
COPD/asthma/ reversible airways disease	Beta-blockers are contraindicated in patients with **reversible** airways disease. The *British National Formulary* (45th edition, 2003) states 'Beta-blockers should be avoided in patients with a history of asthma or chronic obstructive airways disease; if there is no alternative, a cardioselective beta-blocker may be used with extreme caution under specialist supervision'.
Renal dysfunction (e.g. serum creatinine > 200 µmol/litre)	ACE inhibitors and angiotensin-II receptor antagonists may be contraindicated. Patient requires specialist assessment.
Anaemia	Anaemia is common in patients with moderate to severe heart failure and where due to the heart failure (and not other causes) treatment with erythropoeitin and iron therapy may improve symptoms and reduce the risk of hospitalisation for worsening heart failure. The results of several large RCTs addressing this issue are awaited.
Thyroid disease	Severe thyroid dysfunction may cause or precipitate heart failure.
Peripheral vascular disease	Not an absolute contraindication to beta-blocker therapy. High index of suspicion for renal artery stenosis required.
Urinary frequency	Requires appropriate specialist referral. Alpha-blockers may cause hypotension or fluid retention, but are not absolutely contraindicated in patients with heart failure. Diuretics likely to be less well tolerated.
Gout	Avoid non-steroidal anti-inflammatory drugs. Gout can be exacerbated by diuretics and may have an atypical presentation in patients with heart failure. Colchicine may be useful for the treatment of an acute attack of gout. Allopurinol may be useful at reducing the risk of further attacks of gout, but should not be started at the time of an acute episode of gout.

Appendix E: Technical detail on the criteria for audit

Key recommendations	Denominator	Other relevant recommendations	Exceptions	Definition of terms
1.1.3.1: The basis for historical diagnoses of heart failure should be reviewed, and only patients whose diagnosis is confirmed should be managed in accordance with this guideline	1. 'Disease register' % of patients on general practice heart failure registers who have had this diagnosis confirmed.	Where the diagnosis of heart failure is still suspected, but confirmation of the underlying cardiac abnormality has not occurred then the patient should have appropriate further investigation.	Patient choice; or where this would be inappropriate (e.g. terminal illness)	The diagnostic algorithm (see page 5) summarises how a diagnosis of heart failure should be confirmed.
1.1.1.5: Transthoracic Doppler 2D echocardiographic examination should be performed to exclude important valve disease, assess the systolic (and diastolic) function of the (left) ventricle and detect intracardiac shunts	2. Echocardiography % of patients with a new diagnosis of heart failure (in the previous 12 months) who have had an echocardiogram	–	Patient choice; patient declining further investigation, or where this would be inappropriate (e.g. terminal illness)	–
1.2.2.2: All patients with heart failure due to left ventricular systolic dysfunction should be considered for treatment with an ACE inhibitor	3. ACE inhibitors % of patients with heart failure due to left ventricular systolic dysfunction who are prescribed an ACE inhibitor or an angiotensin II receptor antagonist, if ACE inhibitors are contra-indicated	At the time of issue of this guideline, angiotensin II receptor antagonists are not licensed in the UK for heart failure and studies are ongoing. However, they may provide an alternative to ACE inhibitors for patients intolerant of ACE inhibitors (for example, because of cough).	Patient choice; contraindications (see guideline text); or documented adverse events led to withdrawal of ACE inhibitor; heart failure not due to left ventricular systolic dysfunction.	–

Key recommendations	Denominator	Other relevant recommendations	Exceptions	Definition of terms
1.2.2.6: Beta-blockers licensed for use in heart failure should be initiated in patients with heart failure due to left ventricular systolic dysfunction after diuretic and ACE inhibitor therapy (regardless of whether or not symptoms persist)	4. Beta-blockers % of patients with heart failure due to left ventricular systolic dysfunction who are prescribed a beta-blocker	Patients who develop heart failure due to left ventricular systolic dysfunction and who are already on treatment with a beta-blocker for a concomitant condition should continue with a beta-blocker – either their current beta-blocker or an alternative licensed for heart failure treatment.	Patient choice; contraindications (see guideline text); or documented adverse events led to withdrawal of beta-blocker; heart failure not due to left ventricular systolic dysfunction.	–
1.3.1.1: All patients with chronic heart failure require monitoring. This monitoring should include: • A clinical assessment of functional capacity, fluid status, cardiac rhythm, and cognitive and nutritional status • A review of medication, including need for changes and possible side effects • Serum urea, electrolytes and creatinine	5. Monitoring Percentage of patients with proven heart failure who are reviewed on a 6-monthly* basis * this is a minimum	The frequency of monitoring should depend on the clinical status and stability of the patient. Monitoring interval should be short (days to weeks) if the clinical condition or medication has changed, but is required at least 6 monthly for stable patients with proven heart failure	Patient choice	–

Key recommendations	Denominator	Other relevant recommendations	Exceptions	Definition of terms
1.4.2.1: Patients with heart failure should generally be discharged from hospital only when their clinical condition is stable and the management plan is optimised. 1.4.2.2: The primary care team, patient and carer must be aware of the management plan	6. Discharge planning a. % of patients with heart failure who have a pre-discharge management plan in place b. % of patients discharged from hospital with a (primary or secondary) diagnosis of heart failure for whom a management plan has been rapidly communicated to the primary care team	–	Patient choice	'Rapidly' will need to be defined locally for audit purposes
1.5.1.6: Management of heart failure should be seen as a shared responsibility between patient and healthcare professional	7. Patient understanding All patients with heart failure receive a copy of the version of this guideline written for patients, their carers and the public	–	–	–

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