



THE CONTINUING PROFESSIONAL DEVELOPMENT PROGRAMME



This module is suitable for use by pharmacists as part of their continuing professional development. After reading this module, complete the learning scenarios and post-test at www.pharmacymag.co.uk and include in your CPD portfolio. Previous modules in the Pharmacy Magazine CPD Programme are also available to download from the website

MODULE 185

Welcome to the one hundred and eighty fifth module in the *Pharmacy Magazine* Continuing Professional Development Programme, which looks at heart failure. It is valid until February 2014.

Continuing professional development (CPD) is now a legal requirement for pharmacists. Journal-based educational programmes are an important means of keeping up-to-date with clinical and professional developments and form a significant element of your CPD. Completion of this module will contribute to the nine pieces of CPD that must be recorded a year.

Before reading this module, test your existing understanding of the topic by completing the pre-test at www.pharmacymag.co.uk. Then after studying the module in the magazine, work through the six learning scenarios and post-test on the website. Record your learning and how you applied it in practice using the CPD report form, available online and on pviii.

Self-assess your learning needs:

- What are the two main types of chronic heart failure?
- Are you familiar with the NYHA classification system for heart failure?
- What are the aims of optimal drug treatment?

This module supports the following CPD competences: C1c, C3e and C5c.
More details on pvii

CURRENT THINKING ON...

HEART FAILURE

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Introduction

Growing numbers of people have heart failure and the average community pharmacy will dispense medicines for around 80 patients with this condition. With the average age at diagnosis 76 years, many patients will also be on medication for other conditions. Any cardiovascular disease can potentially lead to heart failure, which is manifested by a series of clinical signs such as breathlessness, fatigue and fluid retention.

Although heart failure is difficult to define, it is easy to recognise in clinical practice. There are two main types of heart failure:

- Left ventricular systolic dysfunction (LVSD): This is when the left ventricle that pumps the blood around the body works less than optimally
- Heart failure with preserved ejection fraction (HFPEF): This is when the heart has difficulty filling with blood.

This module provides a summary of current management of heart failure based on the most

recent NICE guideline – ‘Chronic heart failure: management of chronic heart failure in adults in primary and secondary care (CG108)’, issued in August 2010.

Clinical context

It has been estimated that around 900,000 people in the UK have heart failure¹. Both the incidence and prevalence of the disease increases with age, with men at a higher risk than women. That said, due to population demographics, there are more women than men with heart failure¹.

On average, each GP will look after 30 patients with heart failure and suspect the condition in a further 10 patients each year. And, as mentioned, the average community pharmacy is likely to be dispensing medicines for around 80 patients with the condition.

Heart failure is estimated to account for one million in-patient bed days (equivalent to two per cent of all NHS in-patient bed days) and

FOR THIS MODULE

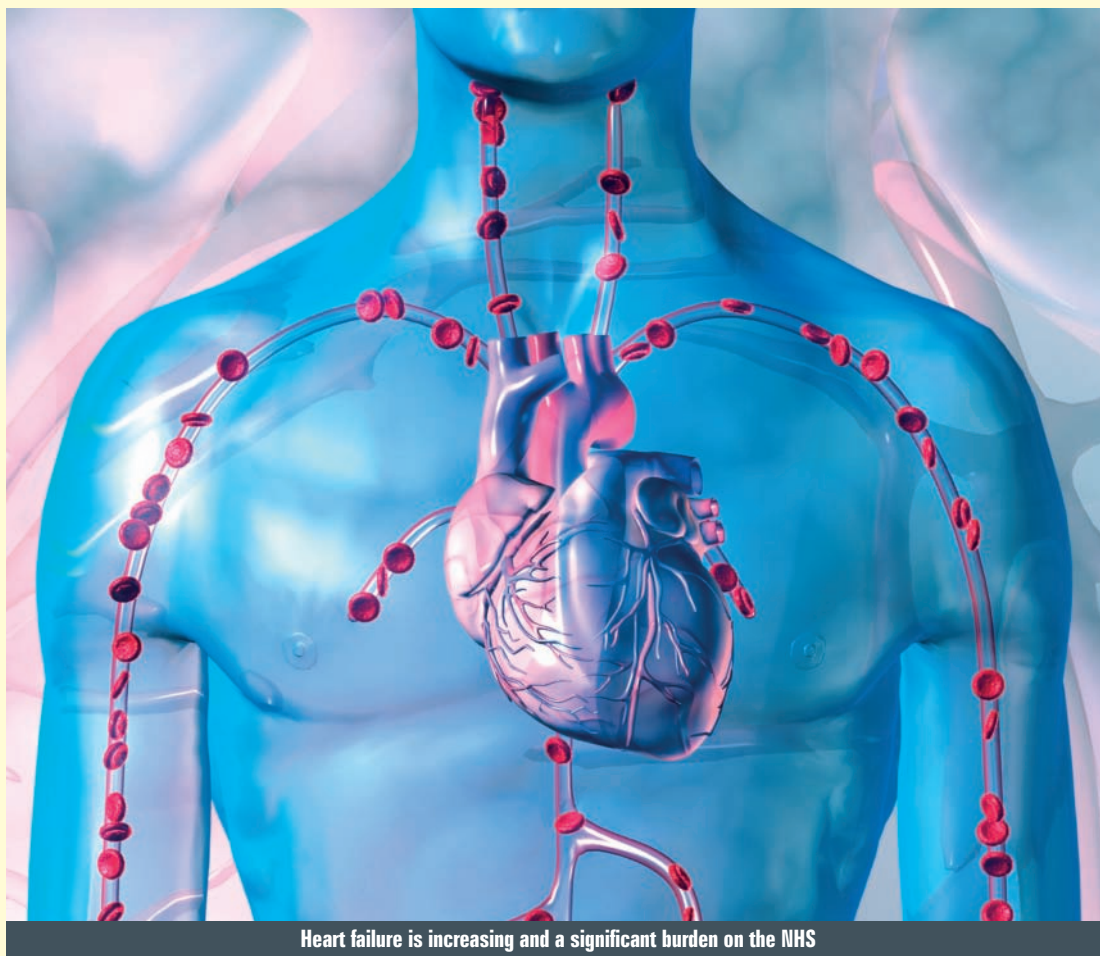
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GOAL: To update clinical knowledge on the diagnosis, management and medicines optimisation for patients with chronic heart failure in primary care.

OBJECTIVES: After completing this module you should be able to:

- Recognise the signs and symptoms of chronic heart failure
- Describe how heart failure is classified and diagnosed
- Discuss optimised therapies and classes of drugs used to manage chronic heart failure
- Plan and conduct a medicines review for a patient with heart failure.





SCIENCE PHOTO LIBRARY

Heart failure is increasing and a significant burden on the NHS

The signs and symptoms of chronic heart failure are mainly a consequence of long-term responses in the body to these two components. For example, salt and water retention is the result of abnormal function of the kidney, while shortness of breath and fatigue are related to chronic changes in the skeletal muscle.

Pathophysiology & prognosis

Chronic heart failure may be regarded as a dynamic situation rather than a steady-state condition. As the function of the heart changes, many patients develop exacerbations which are not always due to identifiable causes. Chronic heart failure is a multi-system disorder associated with systolic and diastolic dysfunction of the myocardial tissue. It is characterised by abnormalities of cardiac and skeletal muscle and renal function, stimulation of the sympathetic nervous system and a complex pattern of neurohormonal changes.

Many clinical features have been shown to have prognostic significance in patients. For example, severity of symptoms, exercise capacity, haemodynamics, plasma hormone concentrations – such as noradrenaline, renin activity and atrial natriuretic peptide (ANP) – are all indicative.

five per cent of all emergency medical admissions to hospital¹. It is estimated that the total cost of heart failure to the NHS is around £716m per year, or around 1.8 per cent of the total NHS budget^{1,2}. In addition to NHS costs, the disease places a significant burden on other agencies (e.g. social services).

A patient's quality of life is affected by the physical limitations imposed by the disease and the emotional problems that arise as a result. The challenge is combined with managing other co-morbidities as well as dealing with polypharmacy and the potential side-effects arising from multi-drug therapy.

Causes

The commonest causes for functional deterioration of the heart are damage or loss of heart muscle, acute or chronic ischaemia,

increased vascular resistance with hypertension or the development of tachyarrhythmia, such as atrial fibrillation. Causative factors include:

- Coronary artery disease (myocardial infarction, ischaemia)
- Hypertension
- Cardiomyopathy
- Congenital heart disease
- Arrhythmias (tachycardia and bradycardia)
- Alcohol
- Medication (including calcium antagonists, anti-arrhythmics, cytotoxic drugs).

Chronic heart failure has two major components: an abnormality of the heart itself and the response of the body to the diminished ability of the heart to function as a pump. Reduced function of the heart as a pump is usually caused by an abnormality of the muscle, heart rhythm, valves or pericardium.

Signs & symptoms

The classical symptoms of heart failure are dyspnoea, ankle oedema and fatigue. Dyspnoea may be due to respiratory disease (particularly COPD) and therefore cannot be the only criterion for the diagnosis of heart failure. Orthopnoea (shortness of breath when lying flat) and paroxysmal nocturnal dyspnoea (a sensation of shortness of breath that wakes the patient after one to two hours of sleep) are more likely to be related to heart failure.

The clinical signs reflect the consequences rather than the causes of heart failure. For example, left ventricular dilatation is reflected in signs of cardiomegaly; fluid retention is reflected in signs of congestion (ankle oedema, jugular venous distension, pulmonary crackles) and low cardiac output in signs of poor perfusion.

Definition of heart failure

Many definitions of heart failure have been documented over the years. These definitions include the features of heart failure, such as haemodynamics, oxygen consumption or exercise capacity. Guidelines from the European Society of Cardiology³ have set out the defining features of heart failure as follows:

Heart failure is a clinical syndrome in which patients have the following features:

1. Symptoms such as breathlessness at rest or with exercise, fatigue, tiredness, ankle swelling
2. Signs such as tachycardia, tachypnoea (rapid breathing), pulmonary rales (crackles), pleural effusion, raised jugular venous pressure, peripheral oedema, hepatomegaly
3. Objective evidence of structural or functional abnormality of the heart at rest (cardiomegaly), third heart sound, cardiac murmurs, abnormality of the heart on echocardiography, raised natriuretic peptide concentration.

Systolic & diastolic heart failure

Heart failure has also been defined as systolic or diastolic.

■ **Systolic heart failure** is associated with a reduction in the systolic performance of the heart, circulatory congestion and progressive activation of various neuroendocrine systems. In later stages, systolic heart failure is characterised by excessive sympathetic nervous system activity such as tachycardia, gallop rhythm, peripheral oedema, ascites and oliguria. Most patients will have an enlarged left ventricle with hypertrophy and remodelling of the chamber, thereby markedly reducing left ventricular function. This is identified in their low ejection fraction on echocardiography. Careful history taking and physical examination is essential to identify systolic heart failure.

■ **Diastolic heart failure** implies normal systolic function of the heart in the presence of clinical heart failure. Diastolic heart failure may be manifest in one-third of patients with chronic heart failure and is signified as heart failure with normal left ventricular function in many of these patients. The most likely group of patients in this category are elderly women with severe systemic hypertension and left ventricular hypertrophy. These patients present with signs of pulmonary congestion, but have a small heart and a normal ventricular ejection fraction on echocardiography.

Chronic heart failure represents a complex clinical syndrome characterised by abnormalities of left ventricular function and neuro-hormonal regulation, which are accompanied by effort intolerance, fluid retention and reduced longevity.

Heart failure classification

The American College of Cardiology and American Heart Association have classified heart failure based on structural changes and symptoms. The classification, known as the New York Heart Association (NYHA) Functional Classification, is routinely used in setting inclusion and exclusion criteria of patients in heart failure clinical trials as well as routine diagnosis and management (see Table 1).

Diagnosis & evaluation

Clinical examination and accurate history taking are essential for the correct diagnosis and evaluation of chronic heart failure.

Dyspnoea

Perhaps the most prominent symptom of heart failure is breathlessness or dyspnoea. The patient is aware of the increased respiratory effort as an uncomfortable sensation and not being able to get enough air.

Chronic fatigue

The second cardinal feature of heart failure is chronic fatigue. Fatigue is a non-specific symptom which, in the past, had been attributed to the low cardiac output, but the mechanism is now thought to be far more complex and poorly understood. It is also likely that abnormalities of the skeletal muscle and biochemistry contribute to poor exercise tolerance and chronic fatigue.

Circulatory congestion

The third sign and symptom of chronic heart failure is circulatory congestion. This shows itself as the presence of neck vein distension, a third heart sound and peripheral oedema – highly characteristic of the heart failure syndrome.

Following a cardiac examination to get an accurate evaluation of heart failure, further clinical tests will be considered. Routine laboratory tests include:

■ **Chest x-ray:** Evaluation of a new patient with heart failure should include a chest x-ray to assess the size of the heart and the pulmonary vascular markings. A chest x-ray may show cardiac enlargement (cardiomegaly), pulmonary venous congestion, pleural effusion and pulmonary infection or infiltration. It can also be used to monitor response to therapy

■ **Echocardiography:** Every new patient should have an echocardiogram in order to assess left ventricular size and function, cardiac

Table 1: The NYHA classification of heart failure

Stages of heart failure based on structure and damage to heart muscle	NYHA functional classification (based on symptoms and physical activity)
Stage A At high risk of developing heart failure No identified structural or functional abnormality; no signs or symptoms	Class 1 No limitation of physical activity Ordinary physical activity does not cause undue fatigue, palpitation or dyspnoea
Stage B Developed structural heart disease that is strongly associated with the development of heart failure, but without signs and symptoms	Class II Slight limitation of physical activity Comfortable at rest but ordinary physical activity results in fatigue, palpitation or dyspnoea
Stage C Symptomatic heart failure associated with underlying structural heart disease	Class III Marked limitation of physical activity Comfortable at rest but less than ordinary physical activity results in fatigue, palpitation and dyspnoea
Stage D Advanced structural heart disease and marked symptoms of heart failure at rest despite maximal medical therapy	Class IV Unable to carry out any physical activity without discomfort. Symptoms at rest. If any physical activity is undertaken discomfort is increased



performance as well as valvular function, such as mitral insufficiency. It is the most useful non-invasive tool for the assessment of left ventricular dysfunction

■ **Electrocardiogram (ECG):** This is relatively inexpensive and provides information on the rhythm and conduction patterns of the heart. Patients with advanced chronic heart failure may regularly have arrhythmias, which are usually diagnosed with simple electrocardiography. Common ECG abnormalities in patients with heart failure may include: sinus bradycardia, sinus tachycardia, atrial tachycardias, flutter or fibrillation, ventricular arrhythmias, ischaemia, left ventricular hypertrophy and atrioventricular block (AV block)

■ **Full blood count, urea, creatinine, electrolytes and thyroid function tests.** A full blood count may identify the presence of anaemia, which can lead to or provoke heart failure. Renal disease, which may mimic heart failure with signs and symptoms of fluid retention, may also be identified from blood tests. Baseline measurement of renal function is also of value in monitoring potential side-effects of drugs affecting the kidneys (e.g. ACE inhibitors). Thyroid dysfunction may also cause heart failure, manifesting initially with atrial fibrillation, particularly in older patients

■ **Urinalysis:** This is a very simple and

Reflection exercise 1

Review the latest NICE guidance at www.nice.org.uk. Study the pharmacological therapies and dose optimisation required for each class. How can you monitor and optimise medication for the next 10 patients you see with chronic heart failure?

inexpensive test which may reveal proteinuria and/or haematuria (indicating renal disease)

■ **Troponins:** Troponin I or T levels are mainly used in order to determine myocyte necrosis in acute coronary syndrome. Troponin levels are also raised in acute myocarditis and in advanced heart failure during a period of severe overload – for example, due to ischaemia

■ **Natriuretic peptides:** The heart secretes natriuretic peptides as a homeostatic signal to maintain stable blood pressure and prevent excess salt and water retention. Atrial natriuretic peptide (ANP) has been identified in the atrial myocardium. B-type natriuretic peptide (BNP) is primarily secreted by the ventricles of the heart as a response to ventricular stretching or wall tension. BNP levels can be used to assess cardiac function, help diagnose heart failure and monitor the success of treatment. However the use of BNP testing has been controversial because of its cost and also because BNP can be increased in pulmonary or renal disease. Nevertheless BNP concentrations are thought to correlate well with severity of heart failure and

prognosis, and NICE advice is to “measure serum natriuretic peptides (B-type natriuretic peptide [BNP] or N-terminal pro-B-type natriuretic peptide [NTproBNP]) in patients with suspected heart failure without previous MI”.

Pharmacological treatment

Pharmacological treatment aims to improve quality of life as well as survival. The relative importance of these two objectives should be decided on an individual patient basis and may change over time in the same patient depending on the stage of heart failure. The BNF states that treatment “aims to relieve symptoms, improve exercise tolerance, reduce the incidence of acute exacerbations, and reduce mortality”. It summarises the current approach to treatment as follows:

“An ACE inhibitor, titrated to a ‘target dose’ (or the maximum tolerated dose if lower), and a beta-blocker is recommended to achieve these aims. A diuretic is also necessary in most patients to reduce symptoms of fluid overload.”

Education and empowerment of patients and their carers regarding medication is an essential part of therapy as patients with chronic heart failure are often on several medicines that need to be optimised gradually in order to achieve the best result according to the evidence-based data available.

Diuretic therapy

Dealing with fluid retention is an important part of managing heart failure patients in order to minimise symptoms of breathlessness due to congestion. Loop diuretics, such as furosemide or bumetanide, are the main agents used. Thiazide diuretics are not used as often in chronic heart failure as they tend to be less effective when glomerular filtration rates are below 30ml/min. Metolazone may be used in severe, resistant chronic heart failure but may result in rapid fluid imbalance so needs to be monitored very carefully.

Electrolyte balance, particularly potassium, should be monitored on a regular basis for all patients with chronic heart failure on diuretic therapy. Renal function should also



Patients with advanced heart failure regularly display arrhythmias

be monitored regularly to avoid worsening of renal impairment or acute renal failure.

During the decompensation period, gut oedema may reduce absorption of tablets and patients may require intravenous therapy in order to ensure 100 per cent bioavailability and clinical effect. This will require admission to hospital or a specialist heart failure outpatient setting for treatment.

Diuretics improve symptoms of breathlessness and exercise performance in patients with heart failure⁴. The NICE guideline⁵ recommends using diuretics routinely for the relief of congestive symptoms and fluid retention in patients with heart failure, titrated (up and down) according to need following the initiation of subsequent therapies. The daily and maximum dose of diuretics recommended by NICE is shown in Table 2.

ACE inhibitors

ACE inhibitors improve survival in heart failure patients with left ventricular systolic dysfunction^{6,7}. The benefit is significant in patients with more severe LV systolic dysfunction or more severe symptoms, although there is a benefit for patients in all NYHA classes. There is also good evidence to suggest that ACE inhibitors reduce the risk of hospitalisation for heart failure^{6,7}.

Many of the pathophysiological abnormalities that characterise heart failure may be reversed by ACE inhibitors. Their main effect is to block the conversion of angiotensin I to angiotensin II, a very potent vasoconstrictor leading to stimulation of the sympathetic nervous system. ACE inhibitors are therefore arterial and venous vasodilators that cause unloading of the heart. As a result left ventricular mass and cavity size is reduced and LV systolic function is improved. Skeletal muscle blood flow is increased, which in turn improves exercise capacity.

ACE inhibitors affect the renal system via neurohormonal pathways, thereby preventing

further deterioration in cardiac function and worsening of heart failure. They also reduce symptoms of fatigue and breathlessness, and improve exercise capacity.

ACE inhibitors should be initiated at a low dose and titrated upwards at short intervals (for example, every two weeks) until the optimal tolerated or target dose is achieved.

Angiotensin II receptor blockers

This class of drugs reduces renin angiotensin activity by blocking the angiotensin II receptor site. These agents are better tolerated than ACE inhibitors but evidence for their use in heart failure is much weaker. ARBs should therefore be reserved for patients who are truly intolerant to ACE inhibitors. The addition of an ARB can also be considered for symptomatic chronic heart failure patients who are already taking conventional therapy.

Similar to ACE inhibitors, ARBs require careful renal function monitoring but, unlike ACE inhibitors, they do not block the breakdown of bradykinin and therefore do not show signs of dry persistent cough as a side-effect. The CHARM-Alternative clinical trial investigated the use of candesartan in chronic heart failure patients and demonstrated that hospitalisation rates as well as all-cause mortality were reduced significantly⁸.

Beta-blockers

Beta-blockers are started at very low doses (e.g. bisoprolol 1.25mg daily) and gradually increased in order to achieve optimisation. Doses should be titrated very slowly over intervals of two to three months according to each individual patient response, aiming for a resting heart rate of 50 to 60 beats per minute. This slow up-titration (NICE calls it “start low, go slow”) is due to the fact that heart failure symptoms may be exacerbated during the initial period of therapy and patients need to be fully informed of this in order to minimise anxiety. These

Reflection exercise 2

Identify your local heart failure clinics. How do they operate and what policies are in place for heart failure drug therapy review and optimisation?

symptoms, which may include an increase in breathlessness and ankle oedema, will subside with time.

Some patients may require adjustment in the diuretic dose to control these symptoms. NHS Clinical Knowledge Summaries advises that “temporary deterioration occurs in 20-30 per cent of people during the titration stage”. The effects of beta-blockers may take some time to become apparent and NHS Clinical Knowledge Summaries advises that “symptoms may improve slowly after starting treatment (over three to six months)”.

Meta-analyses of clinical trials with beta-blockers (bisoprolol and carvedilol) in heart failure has shown a significant reduction in heart rate and therefore survival benefits for heart failure⁹. The BNF advises that “beta-blockers bisoprolol and carvedilol (section 2.4) are of value in any grade of stable heart failure and left ventricular systolic dysfunction; nebivolol (section 2.4) is licensed for stable mild to moderate heart failure in patients over 70 years”.

NICE guidelines recommend that both ACE inhibitors and beta-blockers licensed for the management of heart failure should be offered to all patients with left ventricular systolic dysfunction. Clinical judgement should be used when deciding which to start first. These patients include older adults and those with peripheral vascular disease, erectile dysfunction, diabetes mellitus, interstitial pulmonary disease and chronic obstructive pulmonary disease (COPD) without reversibility.

According to the latest NICE guideline, a patient who may already be on a beta-blocker for a co-morbidity, such as angina or hypertension, should be switched to a beta-blocker licensed for the management of heart failure.

Although the NICE guideline clearly recommends the use of beta-blockers, the RCGP conference in late 2010 heard that there is a reluctance among GPs to prescribe beta-

Table 2: NICE recommendations for diuretics

DRUG	INITIAL DOSE	MAXIMUM DOSE
Loop diuretics		
Furosemide	20-40mg	250-500mg
Bumetanide	0.5-1mg	5-10mg
Thiazide diuretics		
Bendroflumethiazide	2.5mg	5mg
Indapamide	2.5mg	2.5mg
Metolazone	2.5mg	10mg
Potassium sparing diuretics	With ACE (without ACE)	With ACE (without ACE)
Amiloride	2.5mg (5mg)	20mg (40mg)
Triamterene	25mg (50mg)	100mg (200mg)





ACE inhibitors are key therapeutic agents in the management of chronic heart failure

Points to bear in mind during a MUR

- Use your PMR to review the history of the medicines prescribed and dose changes
- Ask the patient/carer how they have been getting on with the medicines
- Look out for medicines with high sodium content
- Give appropriate lifestyle advice
- Make sure your signposting list includes information on local exercise programmes for people with heart failure (may be provided as part of cardiac rehab)
- Watch out for worsening symptoms – NHS Clinical Knowledge Summaries advises that patients should “seek medical advice if they experience a rapid deterioration in symptoms, such as tiredness, fatigue, or breathlessness. Worsening symptoms can usually be controlled by adjusting other medications, and beta-blockers should never be stopped without consulting a healthcare professional”

blockers because of their side-effects. Dr Ahmet Fuat, a GP and member of the NICE heart failure guideline group, told doctors that they “should not be depriving patients, and older patients in particular, with heart failure the use of beta-blockers”. Pharmacists can reinforce not only the need for beta-blockers but also the gradual increase in dose.

Reflection exercise 3

Contact the British Heart Foundation and identify what support and information is available for patients with chronic heart failure.

Aldosterone receptor antagonists

Spironolactone and eplerenone act by blocking aldosterone, thereby reducing water and salt retention. The RALES trial in heart failure patients with NYHA class III and IV demonstrated that spironolactone, added to conventional therapy, reduced both mortality and frequency of hospitalisation¹⁰. It is therefore recommended in the NICE guidance that a licensed aldosterone antagonist may be added to the treatment regimen in patients with class III or IV heart failure or those who have suffered a myocardial infarction if there are still symptoms despite optimal therapy with an ACE inhibitor plus beta-blocker. An angiotensin II receptor antagonist or hydralazine plus a nitrate are alternatives.

Patients on spironolactone should be monitored for signs of renal dysfunction and gynaecomastia. Hyperkalaemia is also carefully monitored, in particular in combination therapy with ACE inhibitors.

Eplerenone is a newer aldosterone antagonist with a better side-effect profile as it is less likely to cause gynaecomastia. Other monitoring requirements are the same as for spironolactone.

It is only licensed in post-myocardial infarction patients with heart failure.

Cardiac glycosides

Digoxin may be used in patients with heart failure who are still symptomatic despite optimised conventional therapy. Trials with digoxin in heart failure patients have demonstrated no survival benefits but the rate of hospitalisation for worsening heart failure was reduced¹¹. Digoxin is usually prescribed at low doses without loading for stable patients in sinus rhythm. Care should be taken in elderly patients for digoxin side-effects. Patients should be monitored for signs of toxicity such as nausea, confusion, disturbance of vision and dysrhythmias.

NICE guidelines for other drugs

The decision to prescribe or continue amiodarone in patients with heart failure should be reviewed regularly. Patients on amiodarone should have a routine six-monthly clinical review, including liver and thyroid function test and a review of side-effects.

Anticoagulation should be considered in patients with heart failure in sinus rhythm if there is a history of thromboembolism. Low-dose aspirin should be prescribed if heart failure patients have atherosclerotic arterial disease such as coronary heart disease.

Lifestyle advice for patients

NICE recommends that lifestyle advice be given to all patients with chronic heart failure:

- Strong recommendation to stop smoking and refer patients to smoking cessation services
- Alcohol consumption should be discussed with patients and those with alcohol-related heart failure should abstain from drinking
- Annual influenza vaccination should be offered to all patients with heart failure

Further information and support

British Heart Foundation

Greater London House, 180 Hampstead Road, London NW1 7AW
Tel (Heart Help Line): 0300 330 3311 Web: www.bhf.org.uk

HEART UK

7 North Road, Maidenhead, Berkshire SL6 1PE
Tel (Helpline): 0845 450 5988 Web: www.heartuk.org.uk
HEART UK (the Hyperlipidaemia Education and Atherosclerosis Research Trust UK) provides information on cardiovascular disease, including heart disease and stroke and its management by diet, lifestyle and drugs

British Cardiac Patients Association

15 Abbey Road, Bingham, Nottingham NG13 8EE
Tel (Helpline): 01223 846845 Web: www.bcpa.co.uk

Reflection exercise 4

You are interested in providing a service to help with the optimisation of medication in patients with chronic heart failure. How would you establish the need for such a service in your pharmacy?

■ Once-only vaccination against pneumococcal disease should be offered to all heart failure patients

■ A supervised group exercise-based rehabilitation programme should be offered to patients with heart failure.

More detailed advice for patients is available. The example below is from patient.co.uk:

■ Diet

If you are overweight, try to lose weight to reduce the extra burden on your heart. Do not have too much salt in your diet, as this can cause water retention. For example, do not add salt to your food at the table and avoid cooking with it

■ Do not smoke

The chemicals in tobacco cause blood vessels to narrow (constrict), which can make heart failure worse. Smoking can also make ischaemic heart disease worse. You may benefit from being referred to local 'stop smoking' services if you are finding it hard to stop smoking

■ Exercise

For most people with heart failure, regular exercise is advised. The fitter the heart, the better it will pump. The level of exercise to aim for will vary from person to person. Before you start to increase your exercise, get the go-ahead from your doctor, as some people with heart valve problems should not exercise. If you are not used to exercise, you could start by going for a daily walk

■ Immunisation

You should have an annual influenza jab and be immunised against the pneumococcal bacterium

■ Weigh yourself each morning

Weigh yourself each morning if you have moderate to severe heart failure. If you retain fluid rapidly, your weight goes up rapidly too.

CPD competences

This module supports the following community pharmacy competences:

Competence	Where this module supports competence development
C1c Reviewing medication with patients to identify difficulties and potential risk (e.g concordance issues, adverse effects, changing medication needs)	Pharmacists are encouraged to undertake MURs with cardiac patients. The module identifies issues that patients may have with their medication and the monitoring required for drugs used in heart failure. Reflection exercise 1 asks pharmacists to consider how they can monitor and optimise medicines' use in patients with heart failure.
C3e Providing pharmaceutical care to patients with chronic diseases	Heart failure is a chronic condition and pharmacists are encouraged to provide pharmaceutical care to patients with heart failure, particularly through planned MURs. In reflection exercise 2 pharmacists are asked to find out about local heart failure clinics to enable them to provide seamless pharmaceutical care. Reflection exercise 3 suggests they find out what support materials are available for patients.
C5c Developing and implementing new services under local or national contracts	Pharmacists are encouraged to consider steps to pilot a service on medication review and optimisation in patients with chronic heart failure in order to avoid hospital admission and readmission. In reflection exercise 4 pharmacists are encouraged to consider how they can identify the need for a medicines optimisation service in their pharmacy for patients with heart failure.

So if your weight goes up by more than 2kg (about 4lb) over one to three days, you should contact a doctor. You may need an increase in your medication

■ Alcohol

You should not drink too much. Men should drink no more than 21 units per week (and no more than four units in any one day). Women should drink no more than 14 units per week

(and no more than three units in any one day). One unit is about half-a-pint of normal strength beer, or two-thirds of a small glass of wine, or one small pub measure of spirits.

■ *Online learning scenarios accompanying this module, together with a pre- and post-test, can be found at www.pharmacymag.co.uk*

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ASSESSMENT QUESTIONS

HEART FAILURE

- Find the FALSE statement:**
 - The commonest cause of heart failure is ischaemic heart disease
 - Incidence of heart failure increases significantly in men and women over the age of 65 years
 - Hospital admission can be minimised by optimising medication appropriately in primary care
 - ACE inhibitors do not improve survival but they reduce hospitalisation
- Which is the least likely to be present in patients with chronic heart failure?**
 - Fatigue
 - Breathlessness
 - Ankle oedema
 - Muscular chest pain
- Which NYHA class is associated with the following activity – "Comfortable at rest but less than ordinary physical activity results in fatigue, palpitation and dyspnoea"?**
 - NYHA I
 - NYHA II
 - NYHA III
 - NYHA IV
- Which is most likely to cause a rapid fluid imbalance?**
 - Bendroflumethiazide
 - Furosemide
 - Metolazone
 - Ramipril
- Which diagnostic test is essential for measuring the ejection fraction or left ventricular function?**
 - Echocardiography
 - Electrocardiogram
 - Electrolytes
 - Troponin
- Which drug has been shown to have no effect in improving survival but may be useful in symptomatic patients who are optimised on conventional therapies?**
 - Ramipril
 - Digoxin
 - Candesartan
 - Bisoprolol
- Which side-effect is more likely to be associated with spironolactone compared to eplerenone?**
 - Hyperkalaemia
 - Hypokalaemia
 - Gynaecomastia
 - Diarrhoea
- ACE inhibitors are much more likely to cause which of the following side-effects compared to ARBs?**
 - Hypokalaemia
 - Hyperkalaemia
 - Dry cough
 - Renal dysfunction

PHARMACY MAGAZINE CPD RECORD – MARCH 2011

USE THIS FORM TO RECORD YOUR LEARNING AND ACTION POINTS FROM THIS MODULE ON HEART FAILURE OR DOWNLOAD FROM WWW.PHARMACYMAG.CO.UK AFTER COMPLETING THE ONLINE LEARNING SCENARIOS

Activity completed. (Describe what you did to increase your learning. Be specific) (Act)

Name/date:

Time taken to complete activity:

What did I learn that was new in terms of developing my skills, knowledge and behaviours? Have my learning objectives been met?* (Evaluate)

How have I put this into practice? (Give an example of how you applied your learning. Why did it benefit your practice? How did your learning affect outcomes?) (Evaluate)

Do I need to learn anything else in this area? (List your learning action points. How do you intend to meet these action points?) (Reflect)

* If as a result of completing your evaluation you have identified another new learning objective, start a new cycle – this will enable you to start at **Reflect** and then go on to **Plan, Act** and **Evaluate**. This form can be photocopied to avoid having to cut this page out of the module. Complete the learning scenarios at www.pharmacymag.co.uk

MODULE 185 ANSWER SHEET

ENTER YOUR ANSWERS HERE Please mark your answers on the sheet below by placing a cross in the box next to the correct answer. Only mark one box for each question. Once you have completed the answer sheet in ink, return it to the address below together with your payment of £3.75. Clear photocopies are acceptable. **You may need to consult other information sources to answer the questions.**

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| 1. | a. <input type="checkbox"/> | 2. | a. <input type="checkbox"/> | 3. | a. <input type="checkbox"/> | 4. | a. <input type="checkbox"/> | 5. | a. <input type="checkbox"/> | 6. | a. <input type="checkbox"/> | 7. | a. <input type="checkbox"/> | 8. | a. <input type="checkbox"/> |
| | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> | | b. <input type="checkbox"/> |
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Name (Mr, Mrs, Ms) _____

Business/home address _____

Town _____ Postcode _____ Tel: _____ GPhC/PSNI Reg no.

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I am a PM subscriber I confirm the form submitted is my own work (signature): _____

Please charge my card the sum of £3.75 Name on card _____ Visa Mastercard Switch/Maestro

Card No. _____ Start date _____ Expiry date _____

Date _____ Switch/Maestro Issue Number _____

Processing of answers
Completed answer sheets should be sent to Precision Direct Marketing, Precision House, Bury Road, Buryton, Bury St Edmunds IP30 9PP (tel: 01284 718918; fax: 01284 718920; email: cpd@precisiondm.com), together with credit/debit card/cheque details to cover administration costs. This assessment will be marked and you will be notified of your result and sent a copy of the correct answers. The examiners' decision is final and no additional correspondence will be entered into.