The management of chronic heart failure: part two

Chronic heart failure (CHF) is a common condition, particularly among older patients, and is associated with a high rate of mortality and morbidity. In the first part of this article, we reviewed the diagnostic tools and medical therapies used in the management of CHF. In part two, we provide guidance on when patients should be referred for more intensive management and focus on device therapies.

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Chronic heart failure affects up to 900,000 people in the UK. Associated with a high mortality rate, of 30% at one year and 60–70% at five years,¹ it accounts for 5% of all UK hospital admissions.²

Most patients with heart failure are over 70 years of age.³ Studies indicate that the relative reduction in mortality from aggressive treatment is similar to that seen in younger patients. But despite these findings, older patients are less likely to receive optimum treatment and if they do receive it, they are less likely to receive it at the optimum dose.⁴,⁵

Conduction tissue disease is common in heart failure, identified by a broad quanton-resonance system (QRS) complex on a surface electrocardiogram. Left bundle branch block (LBBB) is found in 30% of CHF patients and is associated with more severe left ventricular (LV) dysfunction, more severe symptoms and an adverse prognosis. Impaired electrical activation is commonly accompanied by dyssynchronous, inefficient cardiac contraction, increased mitral regurgitation, and regional ischaemia, all of which contribute to further adverse remodelling and a downward spiral of cardiac function.

Aetiology and prognosis

CHF is a syndrome of symptoms and signs in the presence of LV dysfunction. It is not in itself a definitive diagnosis, and in all patients, an attempt should be made to establish the underlying aetiology. This will often include the exclusion of ischaemic heart disease, valvular disease, longstanding hypertension and other aetiologies (box 1). For many patients, coronary angiography will be used to exclude ischaemic heart disease. A formal assessment of exercise capacity is performed in many patients. Peak oxygen consumption (pVO2) during an incremental exercise test is a powerful predictor of prognosis,⁶ and a low pVO2 is helpful in selecting patients for cardiac transplantation.

Medical and device therapies have significantly improved the prognosis for patients with heart failure, and an annual mortality rate of under 10% for all patients is achievable. However, within a population of patients with heart

### Box 1: Aetiologies of heart failure

**Common**
- Ischaemic heart disease
- Dilated cardiomyopathy
- Hypertension
- Valvular disease
- Arrhythmia

**Less common**
- Viral myocarditis
- Thyrotoxicosis
- Haemochromatosis
- Amyloid heart disease
- Parasitic infection
failure, there will be patients at much higher risk. These should receive targeted secondary and tertiary specialist care. High-risk markers that should stimulate a referral to a specialist CHF clinic include renal impairment, new or previous LBBB, recent hospital admissions and anaemia (box 2).

**CRT**

Cardiac resynchronisation therapy (CRT) is a form of cardiac pacing that aims to improve the timing of the electrical activation of the heart, improving overall cardiac function. Electrodes are positioned into the right atrial appendage, the right ventricular apex and, via a tributary of the coronary sinus, the LV posterolateral wall. The target vein is identified by retrograde venography. Venous access is through the subclavian vein as for normal pacing through an infraclavicular incision and the leads are connected to a pulse generator, which is usually placed into a subcutaneous pocket created on the pectoralis muscle. The procedure is carried out under local anaesthetic and takes 45–90 minutes. The generator can be programmed to deliver simultaneous right and left ventricular pacing.

CRT can improve symptoms, reduce the hospitalisation rate and reduce total mortality (both due to heart failure and sudden death). More complex methods of assessing which patients will benefit from CRT have not been shown to be any better than a simple ECG demonstrating LBBB. The National Institute for Health and Clinical Excellence (NICE) state the indications for CRT include “recent or current” severe symptoms (NYHA class III and IV; box 3). These guidelines therefore already include patients who have responded to initiation and uptitration of medical therapy. But, recent data suggest that as with other therapies for CHF (e.g., beta-blockers and ACE inhibitors), CRT applied to patients with left ventricular dysfunction but few symptoms (NYHA class I and II), can prevent or delay deterioration of LV function and symptoms. Indeed the relative risk reduction gained from CRT is greater in those patients with less severe heart failure. The severity and nature of symptoms at baseline seem not to be a good marker of prognostic benefit. Finally, there is no upper age limit for CRT and selected octogenarians benefit to the same extent as younger patients.

**ICD**

Patients with CHF are at risk of sudden cardiac death due to ventricular dysrhythmias. The group at highest risk are patients with a broad QRS (>120ms) and those with severe LV dysfunction (LV ejection fraction <30%). In patients with modest symptoms (NYHA class II), an implantable cardioverter defibrillator (ICD) is associated with a reduction in total mortality. The risk–benefit ratio of defibrillator therapy in patients with more severe heart failure symptoms is likely to be less apparent, as they are more likely to die of heart failure than sudden death. Amiodarone is associated with worse outcomes in CHF and should not be used routinely in patients with left ventricular dysfunction.

 Combined devices providing CRT and ICD functions are available. Patients should be selected carefully, have stable NYHA class III symptoms and few co-morbidities. A decision to implant an ICD into patients older than 75 years must be made very carefully. Patients of advanced age and those with very severe left ventricular dysfunction (LV ejection fraction <10%) are unlikely to benefit from ICD therapy. However, as already discussed, CRT should not be denied on the basis of age.

**Conclusion**

CHF patients can be managed in primary care, but healthcare professionals should consider early subspecialist referral for patients with high-risk features such as worsening...
symptoms, deteriorating renal function, or progression of electrocardiographic abnormalities.

We have no conflict of interest

References


Box 3: NICE guidelines for CRT

Cardiac resynchronisation therapy with a pacing device (CRT-P) is recommended as a treatment option for people with heart failure who fulfil all of the following criteria:

- Currently have or have recently experienced NYHA class III–IV symptoms
- Are in sinus rhythm: either with a QRS duration of 150ms or more on a standard ECG; or with a QRS 120–149ms estimated by ECG and mechanical dysynchrony confirmed by echo
- Have a left ventricular ejection fraction of 35% or less
- Receiving optimal medical therapy