An ICD implantation is indicated in HF patients who either have recovered from a ventricular arrhythmia causing hemodynamic instability or in those with symptomatic HF, LVEF ≤35% (despite at least 3 months of OMT), provided that they are expected to survive substantially longer than 1 year with good functional status, in order to improve survival and reduce mortality and morbidity. CRT is contra-indicated in patients with a QRS duration ≥130 ms.

Patients potentially eligible for implantation of a left ventricular assist device

Patients with 72 months of severe symptoms despite optimal medical and device therapy and more than one of the following:

- LVEF ≤25%
- If measured, peak VO2 <12 mL/kg/min.
- Progressive end-organ dysfunction (worsening renal and/or hepatic function) due to reduced perfusion (which may include deactivating devices, such as pacemaker and/or implantable cardioverter-defibrillator).
- An ICD implantation (which may include deactivating devices, such as pacemaker and/or implantable cardioverter-defibrillator).
- Absence of severe right ventricular dysfunction together with severe tricuspid regurgitation.

Characteristics and components of management programmes for patients with heart failure

- Should employ a multidisciplinary approach (cardiologists, primary care physicians, nurses, pharmacists, physiotherapists, dieticians, social workers, surgeons, psychologists, etc.).
- Should target high-risk symptomatic patients.
- Should include competent and professionally educated staff.
- Should include adherence to smoking cessation programs.
- Components: Optimized medical and device management. Adequate patient education, with special emphasis on adherence and self-management. Patient involvement in symptom monitoring and flexible diuretic use. Tailored after discharge (regular clinic and/or home-based visits; possibly telephone support or remote monitoring). Increased access to healthcare (through in-person follow-up and by telephone contact; possibly through remote monitoring). Facilitated access to care during episodes of decompensation. Assessment of (and appropriate intervention in response to) any unplanned change in weight, nutritional status, functional status, quality of life, or laboratory findings. Access to advanced treatment options. Provision of psychosocial support to patients and family and/or caregivers.
Heart Failure is a clinical syndrome characterized by typical symptoms (e.g. breathlessness, ankle swelling and fatigue) that may be accompanied by signs (e.g. elevated jugular venous pressure, pulmonary and peripheral oedema) caused by a structural and/or functional cardiac abnormality, resulting in a reduced cardiac output and/or elevated intracardiac pressures at rest or during stress.

The current definition of HF restricts itself to stages at which clinical symptoms are apparent. Before clinical symptoms become apparent, patients can present with asymptomatic structural or functional cardiac abnormalities (syndromic or diastolic left ventricular dysfunction), which are precursors of HF. Recognition of these precursors is important because they are related to poor outcomes, and starting treatment at the precursor stage may reduce mortality in patients with asymptomatic left ventricular dysfunction.

Demonstration of an underlying cardiac cause is central to the diagnosis of HF. This is usually a myopathic abnormality (cardiomyopathy), occasionally a reparative process (e.g. myocardial infarction), and rarely a combination of causes.

HFmrEF = heart failure with mid-range ejection fraction; HFrEF = heart failure with reduced ejection fraction; HfPEF = heart failure with preserved ejection fraction.

Demonstration of an underlying cardiac cause is central to the diagnosis of HF. This is usually a myopathic abnormality (cardiomyopathy), occasionally a reparative process (e.g. myocardial infarction), and rarely a combination of causes.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.

In symptomatic HFmrEF (non-cardiac onset): 1. Elevated levels of natriuretic peptides; 2. At least one additional criterion: a. abnormal diastolic function; b. abnormal left atrial size; c. abnormal left ventricular filling pressure with no evidence of systolic dysfunction; d. abnormal septal or parasternal Doppler echocardiography; e. cardiac magnetic resonance imaging; f. abnormal ventricular diastolic stiffness; g. pressure-overload diastolic dysfunction; h. atrial fibrillation with preserved ejection fraction; i. history of heart failure with reduced ejection fraction; j. left ventricular hypertrophy; k. non-ACS acute coronary syndrome; l. type B mitral regurgitation; m. AF; n. clinical suspicion of valvular heart disease.

In asymptomatic HFmrEF: 1. Elevated levels of natriuretic peptides.

HFmrEF is an intermediate stage between HFrEF and HfPEF.

HFmrEF = heart failure with mid-range ejection fraction.