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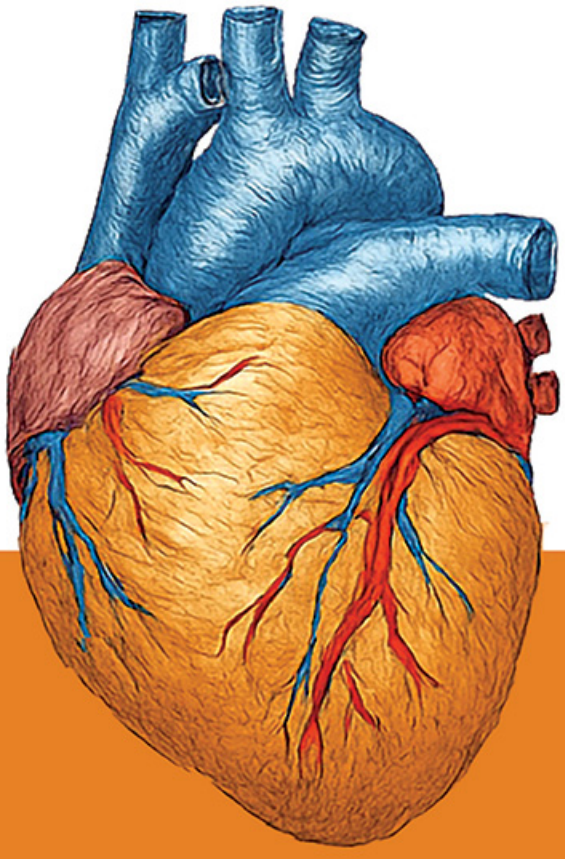

Manual of Heart Failure Management

Harikrishnan S

Foreword
Prof. Robert Bonow

JAYPEE

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Heart Failure: Definition and Types

2

Jabir Abdullakutty

INTRODUCTION

The universal definition published in 2021 defines heart failure (HF) as the following: "HF is a clinical syndrome with symptoms and or signs caused by a structural and/or functional cardiac abnormality* and corroborated by elevated natriuretic peptide levels** and or objective evidence of pulmonary or systemic congestion*** at rest or with provocation (e.g., exercise[1])."

NEW CLASSIFICATION OF HEART FAILURE ACCORDING TO EJECTION FRACTION[1]

The new Universal definition of HF also redefined the classification of HF based on ejection fraction (EF).[1] A new entity, HF with improved EF (previously termed as recovered EF)[2] is added. See **Table 1**.

TABLE 1: Classification of heart failure (HF) based on ejection fraction (EF).[1]

Type	HF with reduced EF (HFrEF)	HF with mildly reduced EF (HFmrEF)	HF with preserved EF (HFpEF)	HF with improved EF (HFimpEF)
LVEF	≤40%	40–49%	≥50%	1. HF with a baseline LVEF of ≤40% 2. A ≥10-point increase from baseline LVEF, and 3. A second measurement of LVEF of >40%

(LVEF: left ventricular ejection fraction)

* The structural or functional abnormality as per new definition is—as determined by an ejection fraction (EF) of <50%, abnormal cardiac chamber enlargement, E/E' of >15, moderate/severe ventricular hypertrophy or moderate/severe valvular obstructive or regurgitant lesion.

** B-type natriuretic peptide (BNP) >35 pg/mL and/or NT-proBNP >125 pg/mL for ambulatory patients and (BNP) >100 pg/mL and/or NT-proBNP >300 pg/mL for hospitalized/decompensated patients.

*** Objective evidence of cardiogenic pulmonary or systemic congestion by diagnostic modalities, such as imaging (e.g., by chest radiograph or elevated filling pressures by echocardiography) or hemodynamic measurement (e.g., right heart catheterization, pulmonary artery catheter) at rest or with provocation (e.g., exercise).

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ACUTE DECOMPENSATED HEART FAILURE

Acute decompensated heart failure (ADHF) is rapid onset of symptoms and signs of HF or worsening from a stable clinical status resulting in a need for urgent therapy.

If the HF is presenting clinically for the first time it is *acute de novo heart failure*.[3] An acute worsening occurring in a person with pre-existing chronic stable HF is *acute-on-chronic heart failure*.[4]

STABLE HEART FAILURE

An HF patient who is on follow-up treatment and whose signs and symptoms remained unchanged for at least 1 month is considered as stable HF.

ADVANCED HEART FAILURE

Heart failure patients with severe cardiac dysfunction, severe signs and symptoms of HF, severe impairment in functional capacity associated with multiple hospital admissions for decompensation requiring intravenous (IV) diuretics and/or IV inotropes.

The HFA–ESC 2018 definition of advanced HF is given below:[5]

- Severe and persistent symptoms of HF [the New York Heart Association (NYHA) Class III (advanced) or IV].
- Severe cardiac dysfunction defined by a reduced left ventricular ejection fraction (LVEF) ≤30%, isolated right ventricular (RV) failure [e.g., arrhythmogenic right ventricular cardiomyopathy (ARVC)] or nonoperable severe valve abnormalities or congenital abnormalities or persistently high (or increasing) B-type natriuretic peptide (BNP) or N-terminal pro-B-type natriuretic peptide (NT-proBNP) values and data of severe diastolic dysfunction or LV structural abnormalities according to the ESC definition of HF with preserved EF (HFpEF) and HF with mildly reduced EF (HFmrEF).
- Episodes of pulmonary or systemic congestion requiring high-dose intravenous diuretics (or diuretic combinations) or episodes of low output requiring inotropes or vasoactive drugs or malignant arrhythmias causing >1 unplanned visit or hospitalization in the last 12 months.
- Severe impairment of exercise capacity with inability to exercise or low 6-minute walk test distance (6MWTD) (<300 m) or pVO_2 (<12–14 mL/kg/min) estimated to be of cardiac origin.

HEART FAILURE WITH PRESERVED EJECTION FRACTION

The new ESC criteria for diagnosis of HFpEF through the Heart Failure Association (HFA)-PEFF algorithm was published in 2019.[6] This will be detailed in Chapter 5 and 52.

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Table 2 describes the revised stages of HF continuum based on the level of disease progression as per the new Universal definition of heart failure guidelines.

Table 3 describes the NYHA symptom Class I–IV. Symptoms include—undue fatigue or tiredness, palpitation, dyspnea (shortness of breath), or anginal pain (chest pain). Symptoms and signs are detailed in Chapter 3.

TABLE 2: The proposed revised stages of heart failure (HF) continuum.[1]

Stages	Definitions	Examples
Stage A *At risk for HF*	• At high risk for HF but without structural heart disease or current/prior symptoms/signs of HF • Normal biomarkers	Risk factors for HF like hypertension
Stage B *Pre-HF*	Structural heart disease but without signs or symptoms of HF	Structural heart disease—LV dysfunction, LV hypertrophy, myocardial structural abnormality, elevated natriuretic peptides
Stage C *HF*	Structural/functional heart disease with prior or current symptoms of HF	Most forms of chronic HF
Stage D *Advanced HF*	Refractory HF requiring specialized interventions	Advanced/end-stage HF

(LV: left ventricular)

TABLE 3: The New York Heart Association (NYHA) symptom class and definitions (similar to other heart diseases).[7]

Class	Description
I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF
II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF
III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF
IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest

(HF: heart failure)

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Manual of Heart Failure Management

Heart failure is emerging as a pandemic globally and the burden is going to affect the low-middle income countries in a big way. It is a disease with high mortality and morbidity. Guideline-directed therapy has shown to benefit the patients by reducing mortality, but the intake of such therapy is inadequate in many countries including India. In the last few years, we have seen emergence of newer therapeutic avenues in heart failure (HF) management, which include pharmacological therapy and devices. In this context, the need for a book to guide all those caring heart failure patients was felt and the national leaders and experts in India have joined together to come out with this manual. The book starts with epidemiology, going through diagnostics and then therapeutics and finally discussing management issues of specific conditions. It covers all the management issues in a simple manner, supported with tables and algorithms wherever possible.

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