

Heart Failure and Cardiomyopathy



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HEART FAILURE

Definition

Heart failure (HF) is a clinical syndrome characterized by structural or functional impairment of ventricular filling or ejection of blood that results in inadequate blood flow to meet the metabolic needs of the body's tissues and organs. HF can be caused by numerous disease processes (Table 5-1).

HF can be classified as HF with reduced ejection fraction (HFrEF) or HF with preserved ejection fraction (HFpEF). HFrEF (i.e., systolic HF) is defined as a left ventricular ejection fraction (LVEF) of less than 40%. Efficacious therapies have been demonstrated for this patient population. HFpEF (i.e., diastolic dysfunction) is defined as an LVEF greater than 50%, and it is more common in women than in men. No efficacious therapies have been discovered for this patient population.

The New York Heart Association (NYHA) functional classification (Table 5-2) defines four functional classes. Class I HF requires no limitations of physical activity; ordinary physical

activity does not cause symptoms. Class II requires slight limitations of physical activity; patients are comfortable at rest, but ordinary physical activity results in HF symptoms. Class III requires marked limitations of physical activity; patients are comfortable at rest, but less than ordinary activity causes symptoms of HF. Patients with class IV HF are unable to carry on any physical activity without HF symptoms or have symptoms when at rest.

The American College of Cardiology Foundation and American Heart Association (ACCF/AHA) staging system (Fig. 5-1) classifies patients either as being at risk for HF or as having the clinical syndrome of HF. Stage A HF includes patients with risk factors for the development of HF, such as hypertension, obesity, atherosclerotic disease, and the metabolic syndrome. Stage B HF includes patients with structural heart disease (i.e., previous myocardial infarction [MI], asymptomatic valvular disease, and LV hypertrophy) but without symptoms of HF. Stage C HF is structural heart disease with prior or current symptoms of HF. Stage D HF is refractory or end-stage HF.

HF should further be characterized by cause (e.g., ischemic, nonischemic, valvular). It can be classified as predominantly left, right, or biventricular; high output or low output; and acute or chronic.

Idiopathic cardiomyopathy is a primary abnormality of the myocardium in the absence of structural or systemic disease. Secondary cardiomyopathies may be related to a significant number of disorders, but in the United States, it is most often the result

TABLE 5-1 CAUSES OF CONGESTIVE HEART FAILURE AND CARDIOMYOPATHY

CORONARY ARTERY DISEASE	Doxorubicin (Adriamycin) Methamphetamine
Acute ischemia Myocardial infarction	METABOLIC-ENDOCRINE CONDITIONS
Ischemic cardiomyopathy with hibernating myocardium	
IDIOPATHIC CONDITIONS	Thiamine deficiency
Idiopathic dilated cardiomyopathy*	Diabetes
Idiopathic restrictive cardiomyopathy	Hemochromatosis
Peripartum cardiomyopathy	Thyrototoxicosis
PRESSURE OVERLOAD	Obesity
	Hemochromatosis
Hypertension	INFILTRATIVE CONDITIONS
Aortic stenosis	Amyloidosis
VOLUME OVERLOAD	INFLAMMATORY CONDITIONS
	Viral myocarditis
Mitral regurgitation	HEREDITARY CONDITIONS
Aortic insufficiency	Hypertrophic cardiomyopathy
Anemia	Dilated cardiomyopathy
Atrioventricular fistula	
TOXINS	
Ethanol	
Cocaine	

*Genetic bases for these cardiomyopathies have been identified in many individual patients and families. Most of the mutations have been found in cardiac contractile or structural proteins.

TABLE 5-2 NEW YORK HEART ASSOCIATION FUNCTIONAL CLASSIFICATION OF HEART FAILURE

CLASS	SYMPTOMS
I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea (shortness of breath).
II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, palpitation, or dyspnea.
III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitation, or dyspnea.
IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of include cardiac insufficiency at rest. If physical activity is undertaken, discomfort is increased.

From the Heart Failure Society of America: Questions about heart failure. Available at http://www.ahouth.org/questions_stages.htm. Accessed August 2, 2014.