

# Contents

## **Preface: Heart Failure in Older Adults** xiii

Wilbert S. Aronow and Ali Ahmed

## **Epidemiology, Pathophysiology, and Prognosis of Heart Failure in Older Adults** 417

Kumar Dharmarajan and Michael W. Rich

Heart failure is the quintessential cardiovascular syndrome of aging that results from common cardiovascular conditions in older adults in conjunction with age-associated changes in cardiovascular structure and function. To a large extent, heart failure is a geriatric syndrome in much the same way that dementia, falls, and frailty are geriatric syndromes. The incidence and prevalence of heart failure increase strikingly with age and make heart failure the most common reason for hospitalization among older adults. Although outcomes for older adults with heart failure have improved over time, mortality, hospitalization, and rehospitalization rates remain high.

## **Diagnosis and Management of Heart Failure in Older Adults** 427

Gurusher Panjrath and Ali Ahmed

Aging is characterized by heterogeneity, both in health and illness. Older adults with heart failure often have preserved ejection fraction and atypical and delayed clinical manifestations. After diagnosis of heart failure is established, a cause should be sought. The patient's comorbidities may provide clues. An elevated jugular venous pressure is the most reliable clinical sign of fluid volume overload and should be carefully evaluated. Left ventricular ejection fraction must be determined to assess prognosis and guide therapy. These 5 steps, namely, diagnosis, etiologic factor, fluid volume, ejection fraction, and therapy for heart failure may be memorized by mnemonic: DEFEAT-HF.

## **Role of Echocardiography in the Diagnostic Assessment and Etiology of Heart Failure in Older Adults: Opacify, Quantify, and Rectify** 445

Vedant A. Gupta, Navin C. Nanda, and Vincent L. Sorrell

Echocardiography allows the assessment of systolic and diastolic function and identifies many of the common causes of heart failure (HF). Patients with minimally symptomatic or unsuspected left ventricular systolic dysfunction may be identified and receive the benefits of angiotensin-converting enzyme inhibitor therapy. Echocardiography is also for assessing prognosis and can be used serially to evaluate treatment. Ventricular filling pressures, pulmonary artery pressures, and cardiac output can be sequentially determined. The authors believe that all patients with HF should receive careful assessment echocardiography. The authors believe using echocardiography is especially valuable in the elderly.

## **Treatment of Heart Failure with Abnormal Left Ventricular Systolic Function in Older Adults** 467

Wilbert S. Aronow

Heart failure (HF) with abnormal left ventricular (LV) ejection fraction should be identified and treated. Treat hypertension with diuretics, angiotensin-converting enzyme

(ACE) inhibitors, and  $\beta$ -blockers. Treat myocardial ischemia with nitrates and  $\beta$ -blockers. Treat volume overload and HF with diuretics. Treat HF with ACE inhibitors and  $\beta$ -blockers. Sacubitril/valsartan may be used instead of an ACE inhibitor or ARB in chronic symptomatic HF and abnormal LV ejection fraction. Add isosorbide dinitrate/hydralazine in African Americans with class II to IV HF treated with diuretics, ACE inhibitors, and  $\beta$ -blockers. Exercise training is recommended. Indications for implantable cardioverter-defibrillator and cardiac resynchronization therapy are discussed.

### **Heart Failure with Preserved Ejection Fraction in Older Adults**

485

Bharathi Upadhyia and Dalane W. Kitzman

Most elderly patients, particularly women, who have heart failure, have a preserved ejection fraction. Patients with this syndrome have severe symptoms of exercise intolerance, frequent hospitalizations, and increased mortality. Despite the importance of heart failure with preserved ejection fraction (HFpEF), the understanding of its pathophysiology is incomplete, and optimal treatment remains largely undefined. Unlike the management of HFrEF, there is a paucity of large evidence-based trials demonstrating morbidity and mortality benefit for the treatment of HFpEF. An update is presented on information regarding pathophysiology, diagnosis, management, and future directions in this important and growing disorder.

### **Use of Diuretics in the Treatment of Heart Failure in Older Adults**

503

Domenic A. Sica, Todd W.B. Gehr, and William H. Frishman

Diuretics are the most commonly prescribed class of drugs in patients with heart failure, and in the short term they remain the most effective treatment for relief from fluid congestion. This article reviews the mode of action of the various diuretic classes and the physiologic adaptations that follow and sets up the basis for their use in the treatment of volume-retaining states, particularly as applies to the elderly. In addition, the article reviews the common side effects related to diuretics.

### **Heart Failure Complicating Acute Myocardial Infarction**

513

Wilbert S. Aronow

Factors predisposing the older person with acute myocardial infarction (MI) to develop heart failure (HF) include an increased prevalence of MI, multivessel coronary artery disease, decreased left ventricular (LV) contractile reserve, impairment of LV diastolic relaxation, increased hypertension, LV hypertrophy, diabetes mellitus, valvular heart disease, and renal insufficiency. HF associated with acute MI should be treated with a loop diuretic. The use of nitrates, angiotensin-converting enzyme inhibitors, angiotensin II receptor blockers, aldosterone antagonists, beta-blockers, digoxin, and positive inotropic drugs; treatment of arrhythmias and mechanical complications; and indications for use of implantable cardioverter-defibrillators and cardiac resynchronization is discussed.

### **The Role of Positive Inotropic Drugs in the Treatment of Older Adults with Heart Failure and Reduced Ejection Fraction**

527

Daniel J. Dooley, Phillip H. Lam, Ali Ahmed, and Wilbert S. Aronow

Positive inotropic drugs have long been studied for their potential benefits in patients with heart failure and reduced ejection fraction (HFrEF). Although there has been an

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