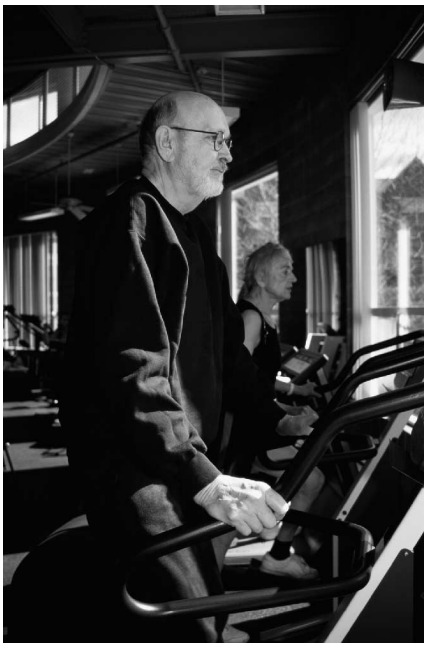
*by Reed H. Humphrey, Ph.D., P.T., FACSM*

# Chronic Heart Failure: The Next Wave

Exercise training for individuals who are diagnosed with coronary artery disease, in combination with medical management, cardiac surgery, or transcatheter interventions, has been a well-accepted component of contemporary treatment for nearly 40 years. Patients initially received supervised exercise training, after an 8- to 10-week convalescence period, in community-based facilities that ranged from YMCAs to university programs that simultaneously provided a service to the community while training students and conducting the necessary research into the effectiveness of exercise and multidisciplinary therapy. Today, there is an extensive body of scientific evidence to support exercise and multidisciplinary interventions. Patients were introduced to exercise rehabilitation as early as hospital discharge, and the supervision of patients shifted to hospitals and other medically supervised settings. As research demonstrated the safety of exercise, regulatory and other forces began to shorten the length of outpatient programs, and the longer term exercise management of these patients shifted back to community-based programs, with a concomitant assimilation of patients into health clubs. The health/fitness community has adapted to this shift with the development of appropriate guidelines based upon the best available evidence to continue exercise management in this patient population.

## The Next Wave

However, with improved survival and more effective medical and surgical management of coronary heart disease, there has been an extraordinary increase in the number of patients living with heart failure. The prevalence of chronic heart failure (CHF) is nearly 5 million, with nearly 550,000 new cases added annually to the total cardiovascular disease burden in the United States. With an annual mortality of just greater than 50,000, the pool of patients living with CHF is sharply rising (1). Approximately one fifth of men and close to one half of women develop disabling CHF within 6 years of their myocardial infarction (MI). The same data set indicates that once diagnosed, the mortality rate may be as high as 70% to 80% within 8 years (1). Although CHF is often considered to be a disease of older individuals, given the high number of myocardial infarcts occurring before age 50, it is reasonable to expect that a large number of available patients with CHF could benefit from exercise in the health/fitness setting.



For many years, patients with CHF were excluded from exercise programs, based upon the rationale that the added myocardial stress would worsen cardiac function. However, research has clearly demonstrated that left ventricular (LV) performance or safety is not compromised by exercise in the presence of stable CHF. Presently, only decompensated CHF or CHF complicated by obstructed LV outflow or a threatening arrhythmia are considered contraindications for exercise training (2). In recent years, clinicians have been safely prescribing exercise training for patients with stable CHF, and the evolving science indicates that exercise improves a variety of important physiologic outcomes, quality of life, and morbidity and mortality (3–8).

Despite the overwhelming evidence, CHF is not reimbursed in the context of cardiac rehabilitation. The sheer volume of patients—and attendant direct cost to the insurers—likely is associated with the reluctance of insurers to include CHF in cardiac rehabilitation. Whereas some patients with CHF qualify through a coexisting diagnosis such as MI or cardiac surgery, inclusion of these patients in the health/fitness setting is crucial. The first step is an understanding of how these patients differ from other clients.

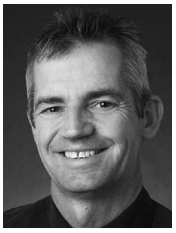
## Considerations in Chronic Heart Failure

Reduced LV contractility associated with impaired ejection fraction and compliance contributes to reduced cardiac output and peak oxygen uptake. Peripherally, a persistently

high LV afterload associated with excess autonomic sympathetic stimulation, endothelial dysfunction, and impaired skeletal muscle blood flow is associated with disuse atrophic changes and a decrease in Type I muscle fibers. In light of the central limitations imposed by the decrement in LV function, and the limited potential for central adaptation, the principal physiologic goals of aerobic exercise training are the recruitment and adaptation of Type I muscle fibers and reduction of LV afterload. Intriguing data exist that have shown improvements in fitness without a compromise in LV function or safety through the use of very high-intensity anaerobic interval training format, using a cycle ergometer (9, 10). Although these studies provide an interesting insight as to the physical stress that patients with CHF may tolerate, they have limited practicality, particularly when lower intensity programs have yielded important beneficial outcomes. Moreover, for many patients, high-intensity interval training regimens may not reach caloric thresholds necessary to normalize body mass or achieve a good level of cardioprotection.

As in apparently healthy individuals, muscular fitness can be safely included for those with coronary artery disease (CAD). Ample data suggest that resistive exercise training, following guidelines published for patients with CAD (2), safely provides additional functional value for patients with CHF (11).

Patients with CHF represent the next wave of older clients in health/fitness facilities, both in the United States and worldwide. Recent research has demonstrated that both aerobic and resistive exercise training are safe and effective for patients with stable CHF, and there are contemporary guidelines to aid the health fitness professional in the design of appropriate exercise programs.



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