

**Harvard Medical School Department of  
Continuing Education and the Cardiovascular  
Division of the Department of Medicine,  
Brigham and Women's Hospital**



***Cardiology Rounds***  
**May 2003**

**Exercise Intolerance and the Role of Exercise Training in Heart Failure**

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**Objectives:** In this issue of *Cardiology Rounds*, Professor Gary Balady, an authority on the diagnostic and therapeutic uses of exercise in heart disease, provides a summary of the potential of exercise training to treat heart failure. The objective of these rounds is to familiarize the reader with the mechanisms believed to result in exercise impairment in patients with heart failure. Although fatigue and dyspnea are multifactorial, Dr. Balady points to central circulatory factors involving ventricular systolic and diastolic function, as well as heart rate response, peripheral mechanisms involving regional blood flow and, even more importantly, skeletal muscle function, metabolism, and ventilatory responses. After reading this issue, the reader should be able to describe impairments in each of these contributing systems and be aware of data regarding the effects of exercise training on altering these components of the exercise response.

**TEST:**

1. Until the 1980s, exercise was generally prohibited in patients with symptomatic heart failure.  
True       False
2. In patients with heart failure, ventilatory reserve is usually not the predominant reason for the limitation in exercise capacity.  
True       False
3. Patients with chronic heart failure may have reduced skeletal muscle mass as well as reduced function.  
True       False
4. In patients with symptomatic heart failure and depressed ventricular function, exercise training has been shown most consistently to improve left ventricular ejection fraction.  
True       False

5. Exercise training in patients with heart failure has been shown to reverse some of the abnormalities in skeletal muscle function.

True       False

6. Although exercise training has the potential to increase the risk for sudden death, these concerns have yet to be confirmed in the early clinical experience.

True       False

7. Left ventricular remodeling after myocardial infarction is adversely influenced by exercise training.

True       False

To receive AMA category 1 credit, you must correctly answer 60% of the test questions.

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