

MODALITY OF EXERCISE TRAINING IN PATIENTS WITH CHRONIC HEART FAILURE

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Heart failure (HF) is the result of structural and/or functional heart abnormalities, leading to reduced cardiac output and/or increased intracardiac pressures, either at rest or under stress¹. The 5-year mortality rates in patients with chronic advanced HF is greater than 50% despite improvements in therapy, changes in lifestyle, and better adherence to guidelines. Exercise-based cardiac rehabilitation is an essential tool for managing HF and has been recommended with Class IA evidence in HF management guidelines. Studies have shown^{1,2} that exercise training (ET) can improve cardiac function, enhance exercise tolerance, and improve quality of life. Although the benefits of exercise are well documented for people with chronic and stable HF, there is still no consensus on whether exercise prescriptions can be universally applied to all types of HF patients^{2,3}.

There is still a need to understand which components of exercise training prescription including frequency, intensity, time (duration), type (modality), and their combination are the most efficient at improving cardiovascular adaptations to ET. The aim of this paper is to describe and evaluate the evidence on different modalities of ET in patients with congestive heart failure. The establishment of an "optimal dose" of ET provides a major challenge and must take into account several factors with respect to the training program and the individual. In order to achieve the beneficial effects of ET, it is necessary to combine the different modalities of load. We have chosen to focus on several different forms of ET that may represent complementary approaches, including inspiratory muscle training (IMT), aerobic exercise training (AET) (both continuous and interval training), resistance training (RT) and combination of AET and RT. Inspiratory muscle training has been prescribed in patients with CHF and include improvements in $\text{VO}_{2\text{peak}}$, VO_2 kinetics during recovery, ventilatory efficiency (VE/VCO_2 slope), dyspnea, and functional capacity. IMT is prescribed using a percentage of as a maximal inspiratory pressure (P_{Imax}), starting at 30%, with adjustment of the intensity every 7-10 days (up to 60% of P_{Imax})⁴, depending on symptoms and response to treatment. The combination of AET and resistance training is particularly suitable for HF patients because they can be adjusted according to the physical condition and lifestyle of HF patients.

A combination of these exercises helps increase to gradually increase the intensity of exercise, starting with low-intensity aerobic activities and progressing to moderate RT. This approach avoids excessive overload at once and helps improve exercise tolerance. This modality exercise has significant intervention effects, improving cardiovascular function, enhancing muscle strength, and boosting endurance^{2,3,4}. This enables HF patients to better cope with daily activities such as walking, climbing stairs, and lifting objects. Continuous AET may be considered as another efficient option, demonstrating

the development of relevant adaptations to aerobic fitness for the treatment of CHF patients. CT may be capable of promoting superior VO₂ peak benefits, although Interval AET also provides benefits in VO₂ peak compared to the non-intervention group. Interval training is also a widely preferred exercise intervention among HF patients. Since IT has a shorter duration and does not require prolonged periods of high-intensity exercise, many patients are more likely to accept and consistently engage in this type of exercise, which relatively improves treatment adherence and long-term outcomes.^{4,5,6} Conclusion: Long-term ET, which forms the basis of the program and content of Exercise-based cardiac rehabilitation, leads to numerous positive effects that are well documented in the literature. ET and exercise programs for patients with CHF must be tailored to the individual's exercise capacity and risk profile, with the aim of achieving and maintaining the highest possible level of fitness for the individual.

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