This study was not randomized when used as an adjunct to aerobic exercise training for LE’s and UE’s. An educational program for patients with heart failure, taking place once a week. The purpose of the study was to evaluate any changes detected during a six month follow up.

Methods and Materials
This study was a non-randomized study where 116 patients were divided according to age into Group 1 (>70 years) and Group 2 (<70 years). These two groups took part in a 4-week training program. There was a special educational program for patients with heart failure, taking place once a week. The training program was made up of endurance training using a bicycle ergometer and the 6-minute walk test as training unit. There was also strength training for LE’s and UE’s. An echocardiography was used to measure the LVEF. For the testing of the cardiopulmonary performance, they used a bicycle ergometric device to measure gas exchange parameters and peak VO2. Quality of Life was measured using the German version of the SF-36.

Results
There were differences in the clinical parameters and the quality of life between the older and the younger patients both after 4 weeks and at the follow-up. After six months, however, the older patients again recorded having an inferior quality of life to that of the younger patients.

Discussion
This study showed an increase in physical performance in elderly patients. The results showed a clear correlation between peak VO2 and performance in the 6-minute walk test as a training unit. Muscle strength tests are not contraindicated in patients with CHF and can also be used in older patients according to this study. The results showed that in older patients, compared to the younger patients, they are able to increase their physical performance even more significantly through physical training. Older patients in particular reported an improved quality of life following the exercise program.

Limitations
• This study was not randomized
• Relatively short period of exercise training

Conclusion
The results of this study underline the necessity of comprehensive intervention, especially in elderly patients if quality of life is to be improved. Elderly patients can benefit from physical exercise training, with improvement in clinical parameters and quality of life. In order to maintain improved quality of life (QOL) in the long term, however, continued special heart failure education and support is required.

Clinical Relevance
CHF has become a great medical challenge that many people face, especially the elderly. Since physical therapists work with a large population of patients with CHF, it is important to know how these patients respond to aerobic and resistive exercise programs. This will help physical therapists have a better understanding of how patients with CHF respond to the specific types of exercises and how we can utilize endurance and resistive training in our profession to help improve their overall quality of life, including ADL’s and functional mobility.

Article 1
This article supports the original article because:
• Resistive training increased the 6-minute walk distance but not peak oxygen consumption.
• When used as an adjunct to aerobic exercise, resistance training did not significantly alter left ventricular ejection fraction peak oxygen consumption or QOL measurement scores compared with aerobic training alone.


Article 2
This article supports the original article because:
• The subjects with CHF who underwent an exercise program composed of endurance or resistance training had an improvement in their peak VO2 max.
• Their muscle strength and endurance either increased or stayed maintained and their overall QOL had a significant increase.


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