

# Exercise for decompensated Heart Failure inpatients – ERIC-HF program

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## INTRODUCTION

Heart failure (HF) is characterized by dyspnea, fatigue and edema that leads to decreased exercise tolerance, functional dependence and impairment of performance in activities of daily living (ADL)<sup>1,2</sup>. Exercise is a well-established intervention, for patients with stable chronic HF, which leads to improvement of symptoms, promotes functional capacity and decrease exercise intolerance<sup>3,5,6</sup>. However, exercise is not yet validated for patients during the phase of stabilization<sup>4</sup>. The ERIC-HF (Early Rehabilitation in Cardiology – Heart Failure) program is an aerobic exercise training (AET) program designed for patients admitted due to decompensated HF, aiming to promote their functional capacity.

## PURPOSE

To evaluate the safety, feasibility and effects on functional capacity of the ERIC-HF program in admitted for decompensation HF patients.

## METHODS

All patients admitted due to HF are randomized in training group (TG) or control (CG). Data includes cardiovascular history, HF history and two functional tools: London Chest of Daily Living Activities (LCADL) and Barthel Index (BI). TG patients perform the ERIC-HF program twice a day, 5 days a week. ERIC-HF program is a supervised AET program, with increasing levels of intensity, divided into 5 stages (figure 1). In all sessions are evaluated vital signs before and after the exercise, as well as Borg Modified Perceived Exertion scale. CG patients are supervised too and perform freely physical activity.

At discharge, all patients perform a 6 minute walking test (6MWT), and evaluation of LCADL scale and BI, for comparison.

**Endpoints** of the study are: difference between admission and discharge score of BI and LCADL, distance walked in the 6MWT and the safety parameters.

## RESULTS

100 patients were randomized (50 in TG – 692 training sessions). 65 were male, 80% are in NYHA class III and 20% are class IV. At admission, both groups of patients have the same characteristics (table 1). The major etiology of HF is ischemic and valvular disease and most patients have reduced ejection fraction (Table 2). At discharge, TG present lower LCADL and Borg score, higher BI score and higher average distance walked in the 6MWT. Differences in LCADL and 6MWT are statistically and clinically significant (p=0,003 LCADL; p=0,026 6MWT) (Table 3). The average distance on 6MWT by TG is 54,2 meters higher.

Regarding safety, only a non-significant number of adverse events had occurred, but none of them were critical, as shown in table 4. Those events are related with the performance of ERIC-HF program stages of exercise, and all of them were properly controlled.

## LIMITATIONS

The main limitations of this study were the fact that not all patients performed the same number of sessions, due to the duration of in-hospital stay; the absence of a 6MWT at admission, the relatively small study sample; and the inability to perform subgroup analysis for important characteristics, particularly left ventricular ejection fraction

## CONCLUSIONS

ERIC program can safely promote functional capacity, being more effective than the usual care. TG patients can walk a few meters more, which is clinically significant, because it means that these patients can be more independent on their ADL's.

Since this is an AET program, we can infer that exercise could be effective and safe, in HF patients during hospitalization, although more investigation is needed, with larger number of participants to firmly validate the feasibility of AET.

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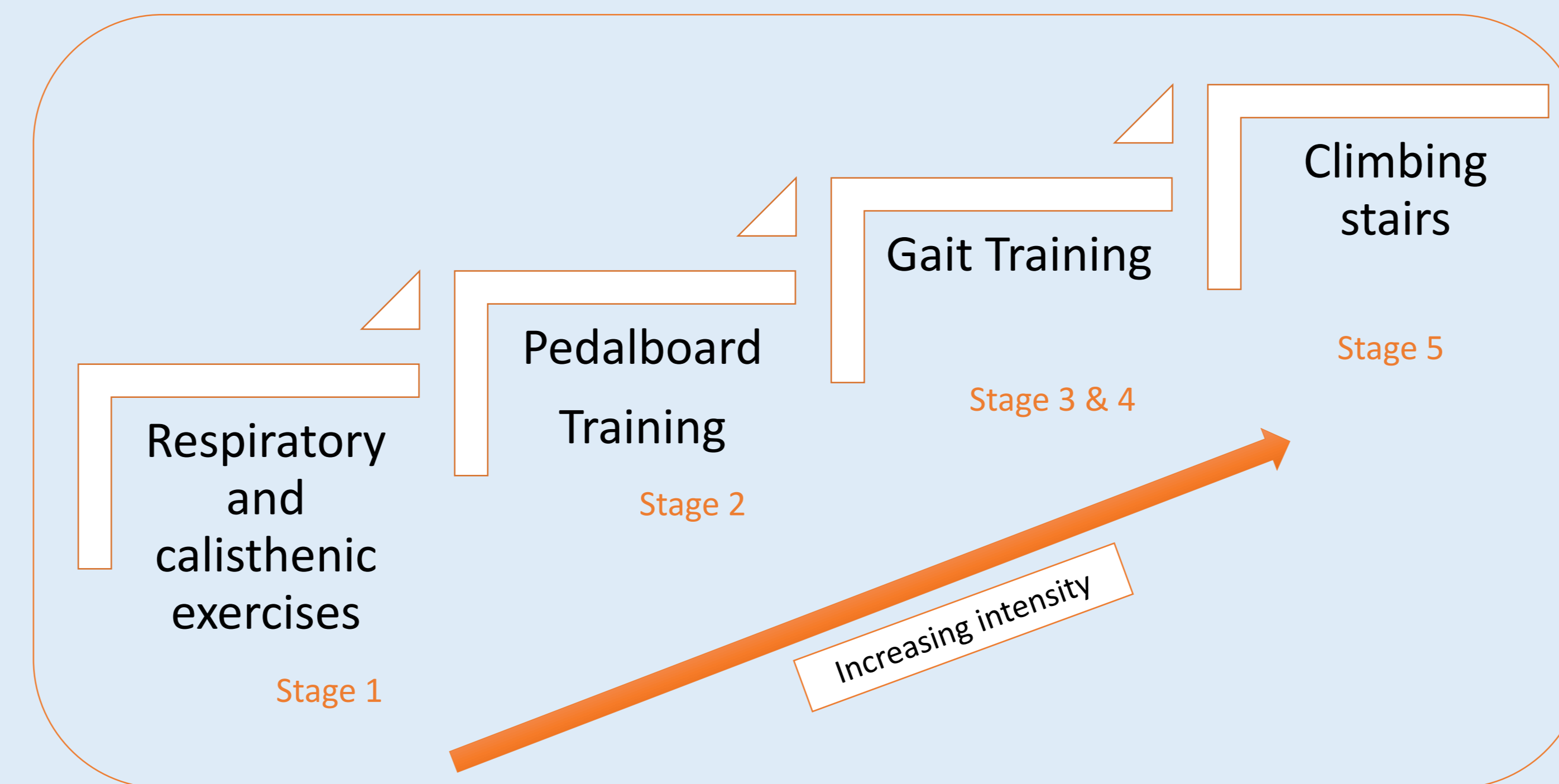


Figure 1 – ERIC-HF program stages

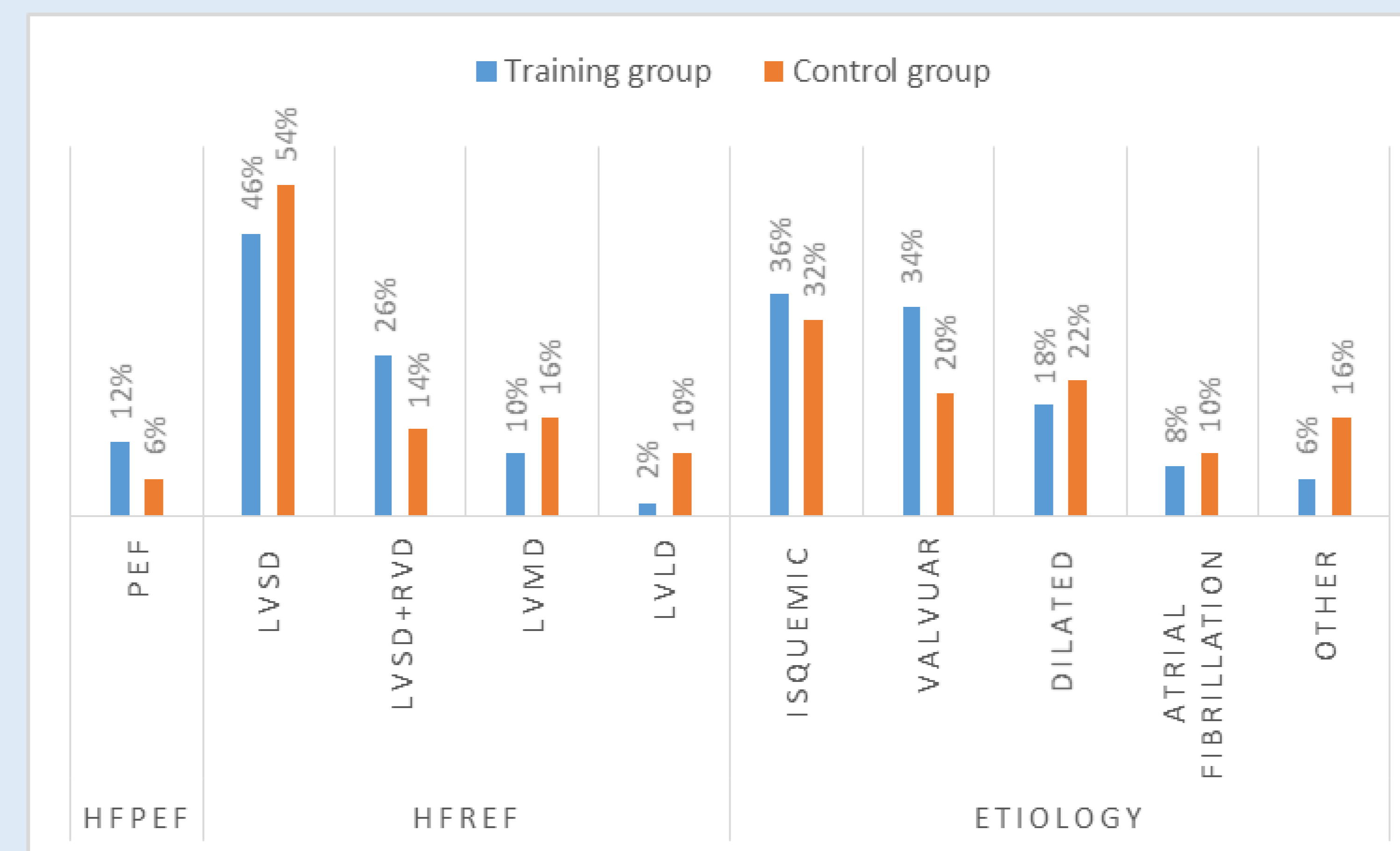


Table 2 – ventricular function and etiology of HF

## Randomization

Parameter	Training group (n=50)	Control group (n=50)	p value
Age (years)	69,3±9,5	70,3±10,5	0,642
Sex	15±9,5 F; 35±9,5 M	20±9,7 F; 30±10,4 M	
Nº of days of internment	19±18,7	18±13,5	0,713
CVRF	3,7±1	3,6±1	0,587
LCADL admission	32±8,5	31,7±7,6	0,874
Barthel admission	73,3±19,9	72,6±16,4	0,839
NYHA III	41	39	0,712
NYHA IV	9	11	0,796

Table 1 – Comparison of baseline characteristics of patients

## Results

Parameter	Training group	Control group	Difference	p value
Barthel final	96±6	92±14	4	0,072
LCADL final	12±4	16±7	4	0,003
6MWT	287,6±128,9	233,4±110,4	54,2	0,026

Table 3 – Endpoints results according to Mann-Whitney U test

Nº of sessions	Atrial fibrillation	Fall of SBP> 20mmHg	Clinical worsening	Borg ≥ 8	Precordial pain
692	12 (1,7%)	38 (5,4%)	0 (0%)	57 (8,2%)	0 (0%)

Table 4 – Nº of adverse events during the sessions of exercise

## HOT TOPICS

- ERIC-HF protocol is SAFE and promotes FUNCTIONAL CAPACITY
- Exercise could be a non pharmacological intervention for all HF inpatients
- Systematization of interventions is the key to effectiveness

