Why should we provide exercise and rehabilitation after pulmonary embolism?

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Functional and Excercise Limitations After a First Episode of Pulmonary Embolism. *Kahn S. et al, Chest (2016)*

100 PE patients

Followed for 1 year

- VO2 peak
- 6 minute walk test
- Lung function
- Quality of life

Results at 1 year (Kahn et al)

46,5% had exercise limitation = VO2 peak <80%

Exercise limitation associated with:

Poorer quality of life

More dyspnea

Shorter walking distance

Cross sectional studies

Mazdak Tavoly et al. 2016 (Norway): 213 patients

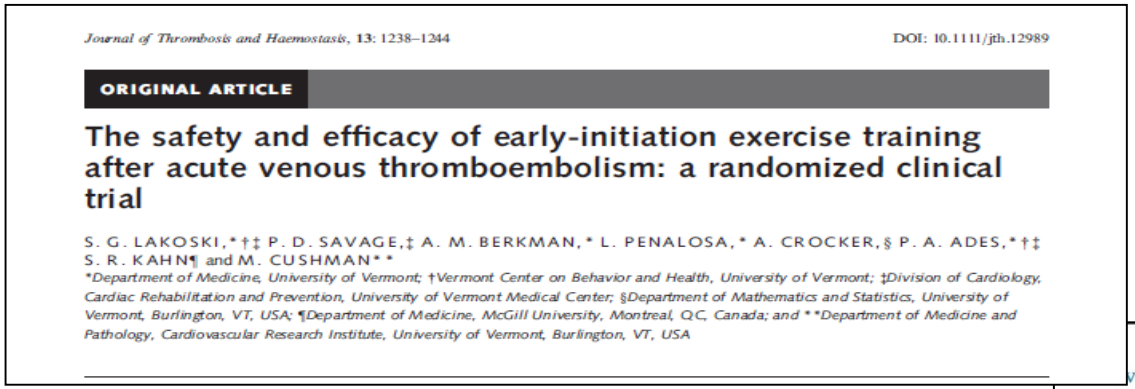
Josien Van Es et al. 2013 (Holland): 109 patients

Frederikus A. Klok et al. 2010 (Holland): 392 patients

Quality of life and physical capacity significantly reduced.

Reduced walking capacity and dyspnea associated with poor quality of life.

Does exercise have an effect, and is it safe?



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ORIGINAL ARTICLE

The safety and efficacy of early-initiation exercise training after acute venous thromboembolism: a randomized clinical trial

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ORIGINAL RESEARCH

Feasibility and safety of rehabilitation after venous thromboembolism

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Background: Venous thromboembolism is a life-threatening disease. In survivors, different degrees of functional complaints need to be restored or prevented (eg, post-thrombotic syndrome, pulmonary hypertension). Therefore, rehabilitation after venous thromboembolism is recommended in Germany. However, a structured rehabilitation program has not been defined for this indication. Here, we present the experience of a single rehabilitation center.
Methods: Data from consecutive pulmonary embolism (PE) patients who were referred for a 3-week inpatient rehabilitation program from 2006 to 2014 were retrospectively evaluated.
Results: In all, 422 patients were identified. The mean age was 63.9±13.5 years, the mean body mass index (BMI) was 30.6±6.2 kg/m², and 51.9% were female. Deep vein thrombosis according to PE was known for 55.5% of all patients. We applied a wide range of therapeutic

Safety and efficacy of early-initation exercise training after acute VTE, *Lakoski et al, J Thromb Haemost (2015)*

Randomized trial; 19 patients with PE (n=11) or DVT (n=8), 6-12 weeks after event.

Exercise intervention: moderate-intensity exercise (70% PHR) 45–60 min per session, 3 months duration. Supervised setting (cardiac rehab) OR home-based programme.

Control group: telephone contact every 2. week.

Results: Exercise intervention was **safe** (no adverse events), **improved physical capacity significantly** in exercise group.

Feasibility and safety of rehabilitation after VTE,

Noack et al, Vasc Health Risk Manag (2015)

Descriptive, retrospective evaluation of 3 week rehabilitation programme at German hospital during 2006-2014.

422 patients, included shortly after VTE event.

Exercise intervention: Nordic walking, ergometer cycle, exercising in machines, and patient education on VTE.

Results: Exercising shortly after VTE event was **safe.** Only few adverse events, not related to exercise (eg pneumonia).

What exercise should patients with PE perform?

Exercise can be targeted centrally (heart and blood) or towards the periphery (muscles and the local blood vessels), where the blood clots typically emerge.

Aerobic exercise gives a better effect than resistance (strength) training, in terms of both arterial stiffness, blood pressure and VO2 max.

There is a dose-response association between effect of exercise and higher intensity and longer duration of exercise.

Ashor AW et al, PLOS ONE (2014)
Kelly et al, Hypertension (2000)
Whelton et al Intern Med (2002)