Why should we provide exercise and rehabilitation after pulmonary embolism?

Nanna Rolving, PT, PhD
Diagnostic Center, Silkeborg Regional Hospital

- 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?

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.

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)