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Title: Twelve-minute walking distance predicts COPD mortality

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Body: Background: Patients in pulmonary rehabilitation (PR) suffer from poor lung function, exercise capacity and health-related quality of life (HRQoL). Some of these factors have been shown to relate to mortality in COPD. Drop-out from clinical PR-studies is often high and might indicate worse prognosis in that group. Aims: To measure the five-year survival of 89 COPD-patients enrolled in a four-month PR at Uppsala University Hospital and investigate if the 12 min walking distance (12MWD), peak exercise capacity (Wpeak), HRQoL and being able to fulfill the training period had prognostic value for survival. Methods: Lung function (FEV_1, VC), 12MWD, Wpeak and HRQoL (SF-36) were measured at baseline. Of 89 included patients, 53 fulfilled the PR-program. Results: Mean baseline FEV_1 was 34 ± 12 (% pred.) and most patients had GOLD stages III or IV. Mean follow-up time was 1732 ± 324 days. Twenty patients (22%) died during follow-up. Causes of death were cancer (n=9), COPD (n=6) and cardiovascular diseases (n=5). Survival among drop-outs and fulfillers (mortality 31% and 17%, respectively) did not differ significantly (p=0.06). At baseline, survivors were younger than non-survivors (p=0.01) and had higher values of FEV_1 (p=0.01), Wpeak (p=0.03) and 12MWD (p=0.0003), but HRQoL was similiar in both groups. Cox proportional hazard analysis including age, FEV_1, Wpeak, 12MWD and the factor “drop-outs/ fulfillers”, revealed low 12MWD (p=0.008) as the only significant mortality predictor in the model, with HR= 0.82 (95% CI: 0.7-0.95), per 50 m increase. With 12MWD < 850 m (= median), relative risk of dying within five years was 4.4 (95% CI:1.2-16.9; p = 0.03). Conclusion: 12MWD is a strong predictor of survival in patients with COPD.