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Title: Correlation between 6-minute pegboard and ring test and upper extremity activities of daily living in patients with chronic obstructive pulmonary disease

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Body: Background Upper extremity training is recognized as an important component of pulmonary rehabilitation (PR). 6-minute pegboard and ring test (6PBRT) was developed for testing arm exercise capacity of patients with COPD. The purpose of this study was to apprehend characteristics of this test and to evaluate the relationship between 6PBRT and upper extremity activities of daily living (ADL) in patients with COPD. Methods Twenty outpatients with COPD performed 6PBRT, spirometry, maximal inspiratory pressures, maximal expiratory pressures and grip strength. The 6PBRT was done according to the method of Zhan et al. In brief, subjects were asked to move as many rings as possible, and the final score was the number of moved rings during a 6-minutes period. Upper extremity ADL was evaluated with the upper extremity activities subdomain of Pulmonary Functional Status & Dyspnea Questionnaire-Modified Version (PFSDQ-M). Upper extremity ADL was also measured objectively by the wrist accelerometer (Actiwatch2®) all day long for a week. Results There was a positive correlation between the 6PBRT scores and inspiratory capacity (IC) ($r = 0.71$, $p < 0.001$), inspiratory capacity/total lung capacity (IC/TLC predicted) ($r = 0.68$, $p < 0.01$), forced vital capacity (FVC) ($r = 0.57$, $p < 0.01$). And there was a positive correlation between 6PBRT scores and Actiwatch2® counts ($r = 0.54$, $p < 0.05$), and a negative correlation between 6PBRT scores and arm activities subdomain scores ($\sigma = -0.49$, $p < 0.05$). Conclusion 6PBRT may be one of the predictive tests for PR to maintain and improve upper extremity ADL in patients with COPD.