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Title: Daily physical activity in patients with chronic obstructive pulmonary disease

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Body: Background: Patients with chronic obstructive pulmonary disease (COPD) are known to be significantly inactive in daily life. For the development of adequate intervention strategies, it might be a good approach to quantify the amount of daily physical activity (PA). Objective: The primary aim of this study was to examine PA levels across COPD stages and COPD risk groups. Method: Stable patients with COPD Gold stages I-IV were recruited at the University Hospital of Basel, Switzerland. Participants were classified into four risk groups A to D according to the revised Gold guidelines of December 2011. PA was measured by the validated SenseWear Mini Armband on seven consecutive days. Average daily number of steps, activity based energy expenditure (AEE) and time spent in PA above 3 METs (PA3) were chosen as primary outcomes. Results: Complete data were available from 77 individuals (59.7% male, age 66.9±9.8yrs, Body Mass Index (BMI) 25.8±5.5kg/m², steps 4760±3383, AEE 436.1±381.5cal, PA3 96±84min). Steps ($p<0.01$), AEE ($p<0.01$) and PA3 ($p<0.05$) were all found to be significantly higher in COPD risk group A compared to B. In contrast, only steps were observed to be significantly lower in COPD stage IV compared to I and II ($p<0.01$). BMI showed a negative correlation with AEE ($r=-0.27$, $p<0.01$) and PA3 ($r=-0.44$, $p<0.01$). Age was found to be inversely associated with steps ($r=-0.24$, $p<0.05$), while gender was not found to correlate significantly with any of these measures. Conclusion: This study provides evidence that daily PA is significantly impaired in severe COPD stages and risk groups compared to early ones. However, COPD risk groups seem to reflect disease severity more accurately than COPD stages do.