

**Cut-off scores of the mMRC and CAT to predict short-term exacerbations in people with COPD**  
**Pontos de corte da mMRC e do CAT para predizer exacerbações a curto prazo em pessoas com DPOC**

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## English version

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**Background:** Research on prediction and prevention of acute exacerbations in people with chronic obstructive pulmonary disease (AECOPD) has become a priority since these events are frequent and have a negative impact on health status and disease progression. Dyspnoea and poor health status, which can be assessed with the modified Medical Research Council dyspnoea questionnaire (mMRC) and the COPD assessment test (CAT), respectively, have been associated with an increased risk of AECOPD. Cut-off scores for prediction of AECOPD are, however, lacking for use in clinical practice.

**Aim:** To identify the cut-off scores of the mMRC and the CAT for determining risk of an AECOPD in the subsequent month.

**Methods:** An observational, prospective study was conducted in people with COPD. At inclusion, people with COPD had to be clinically stable for at least 1 month, i.e., no hospital admissions, AECOPD or changes in respiratory medication in the last month. Age, sex and lung function were collected cross-sectionally, at baseline, and participants were followed monthly for six months. Follow-up assessments included the mMRC, the CAT and the occurrence of an AECOPD in the previous month. Differences between people who suffered an AECOPD and those who did not suffer an AECOPD were explored with independent t-tests. Receiver operating characteristic analysis was performed and the area under the curve (AUC), sensitivity, specificity and accuracy were calculated. The optimal cut-off points were identified by the highest Youden index.

**Results:** In total, 139 people with COPD (67.6±8.8 years; 83.5% male; FEV<sub>1</sub> 53.6±22.1%predicted) participated. From these, 35 (25.2%) suffered an AECOPD during follow-up. People suffering an AECOPD were older (70.3±9.7 vs. 66.7±8.3 years, p=0.033) and had worse lung function (FEV<sub>1</sub> 43.3±13.6 vs. 57.7±23.2%predicted, p<0.001) than participants who did not suffer an AECOPD. Cut-off scores of 1.5 for the mMRC (AUC=0.67; 95%CI 0.57-0.76; 71.4% sensitivity; 53.8% specificity; accuracy=0.58) and 16.5 for the CAT total score (AUC=0.65; 95%CI 0.55-0.75; 45.7% sensitivity; 78.8% specificity; accuracy=0.71) were found to discriminate between people who suffered or not an AECOPD in the subsequent month.

**Conclusion:** The mMRC and the CAT are simple questionnaires with an acceptable discriminative ability and good accuracy in predicting short-term AECOPD. Cut-off scores of 1.5 in the mMRC and 16.5 in the CAT total score may be used to help detecting people with COPD at an increased risk of suffering an AECOPD. The screening of these questionnaires in routine clinical appointments may support clinicians in identifying people at risk of an AECOPD and thus, possibly contribute to the implementation of timely cost-effective preventive strategies.

**Keywords:** COPD; exacerbation; prediction; COPD assessment test; modified Medical Research Council; patient-reported outcome