subgroups of severity of airway obstruction based on their post-bronchodilator FE_1 percentage predicted value (FE_1 % predicted; 80% no obstruction; 70-80%: mild obstruction; 50-70%: moderate obstruction; <50%: severe obstruction). Exacerbation-related health care cost were determined by counting the units of resources consumed and converting these into monetary values (€).

Results: Mean age of the 286 patients involved was 59.2 (SD 9.6) years, post-bronchodilator FE_1 % predicted was 67.1 (SD 16.2). Of all patients, 220 (77%) experienced at least one exacerbation during the 2-year observation period. Mean annual exacerbation rate was 0.88 (SD 0.79). The annual exacerbation rate did not differ between the subgroups of severity of airway obstruction (p=0.628). Mean health care cost per exacerbation was €67 (95% CI 57, 77). When costs were expressed as the annual exacerbation cost per patient, the mean costs in the severity subgroups were €80, €106, €122 and €183, respectively (p=0.013). The gradual increase of the annual exacerbation cost across severity subgroups was mainly attributable to more physician consultations and more prescriptions for bronchodilators and other relieve medication.

Conclusions: The occurrence rate of exacerbations in COPD may not depend on the severity of airway obstruction, but the annual exacerbation-related health care cost per patient appear to increase as obstruction becomes more severe.

Discontinuation of inhaled steroid treatment in chronic obstructive pulmonary disease. An observational study in general practice (*Prim Care Respir* 2002 **11(3)** 96)

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Objectives To assess the probability and explore determinants of an adverse respiratory outcome after discontinuation of inhaled corticosteroid treatment in subjects with chronic obstructive pulmonary disease (COPD) diagnosed in general practice. Design - Prospective observational inhaled steroid withdrawal study.

Setting: 45 Dutch general practices. Participants - 232 subjects with a general practice based diagnosis of COPD with various degrees of airflow limitation. All subjects were treated with inhaled steroids.

Main outcome measures Probability of, and time to an adverse respiratory event within 3 to 7 months after inhaled steroid withdrawal.

Results: Overall probability of an adverse respiratory event was 0.37 (95% CI 0.31, 0.44). Mean number of days until adverse respiratory event was lowest when steroid withdrawal was initiated in January through April and July through August (p=0.072). Univariately, those experiencing an adverse respiratory event tended to be more often female, were older and showed higher reversibility of airflow limitation. Multivariate survival analysis resulted in a hazard ratio for females of 2.14 (95% CI 1.31, 3.50) compared to males. For age, the hazard ratio was 1.05 (95% CI 1.02, 1.08) per year of increased age. Depending on the baseline inhaled steroid dosage, age, gender, smoking status and reversibility were independent predictors of adverse respiratory event after discontinuation of inhaled steroid treatment.

Conclusions Abrupt withdrawal of inhaled steroids is likely to harm at least some patients with COPD. Probability of an adverse respiratory response after inhaled steroid withdrawal may vary throughout the year and appears to be higher in women, elderly subjects, smokers and subjects with reversible airflow limitation.

Accuracy of spirometry in general practice. results of an evaluation study in patients with chronic obstructive pulmonary disease (COPD) (*Prim Care Respir* 2002 **11(3)** 96)

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Background At this time, many general practices in the Netherlands have their own spirometer. However, there are indications in the literature that spirometry performed in the general practice setting may be inaccurate.

Aims: To compare FE_1 and FVC values obtained in general practice to a 'gold standard', i.e. the same parameters obtained in a pulmonary function laboratory by an experienced lung function technician.

Methods General practitioners and practice assistants from 61 Dutch general practices were trained to perform spirometry. Subsequently these practices recruited patients with COPD for study participation. For each patient, pre- and post-bronchodilator (BD) FE_1 and FVC values were first assessed in a pulmonary function laboratory and within a few days again in the patients' own general practice. The same type of spirometer (Microloop II, MicroMedical Ltd.) and spirometry software (Spirare, Diagnostica Ltd.) was used in all practices as well as in the pulmonary function laboratory.

Results: Pairs of spirometric tests were available for 299 patients. (197 males, mean age 59.2 [SD 9.6], mean FE_1 % predicted 62.8 [SD 17.6]). Pre-BD FE_1 was on average 79 ml (95% CI 55, 103) and FVC 99 ml (95% CI 54, 143) higher for the general practice measurements. For post-BD measurements, FE_1 was 61 ml (95% CI 39, 84) and FVC 49 ml (95% CI 3, 95) higher, also in favour of the general practice measurements.

Conclusion Relevant spirometric values (FE_1 and FVC) obtained in general practice appear to be equivalent to values obtained in a pulmonary function laboratory. Further analyses of our data are required to eliminate possible alternative explanations for this rather unexpected finding.