

Time has come for new Reference Values of Ventilatory Lung Function!

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Within the last five decades, the structure of our aging population significantly changed along with anthropometrical data. Therefore the question arises whether or not the commonly used reference values of ventilatory lung function for the Caucasian population, introduced by the European Community for Coal and Steel (ECCS) in 1983, may still be accepted today, since these values were obtained in the sixties and seventies from subjects with a restricted range of age and body height. Birth cohort effects and a largely improved technology should be updated. Measured values for the increasing number of elderly must be classified by extrapolating the reference equations obtained from a different population beyond the age range. Therefore decisions in elder and smaller subjects concerning compensation due to impaired lung function after industrial exposure are much questionable. In the last two decades several new reference formulas were published, finding higher values for lung function. Compared to the recently published recommendations, ECCS-values are lower, and the lower limit values of normal may not represent the cut off point between “normal” and “diseased”. Three models may be discussed for the changes in lung function related to aging. After the age of 65 a normal course of aging could result in a further linear decrease in spirometric parameters with the same slope as observed in middle aged groups. Secondly, healthy older subjects may have nearly constant values for lung function. Finally, accumulation of diseases may result in a steeper decrease of lung function, as observed in patients with COPD or in heavy smokers. The current reference formulae available from the literature are incomplete concerning spirometric parameters (NHANES, Hankinson, 1999, only FVC, FEV₁, FEV₆, PEF, FEF₂₅₋₇₅) the range of age (SAPALDIA, Brändli, 1996, 20-60 years, FEV₁, FVC, FEV₁%FVC, PEF, MEF_{75,50,25}, MEF₂₅₋₇₅), or contain a selection bias (Luftibus-Study, Kuster, 2008), since only subjects were investigated who paid for a lung function test because of their personal reasons. In order to perform a comprehensive diagnosis of lung function, static and dynamic lung volumes are needed along with maximal expiratory values. By now, a complete set of parameters is available only from ECCS recommendations. A linear extrapolation of the ECCS reference equations is the most simple temporary solution, but an extrapolation is not generally recommended. All manufactures however have implemented the extrapolation in their systems and lung function laboratories largely use them. This procedure does not base on scientific background and raises the question, if one can rely on diagnosis of lung



function based on extrapolations. The European Task Force on Standardisation of Lung Function testing has recently published a series of detailed recommendations. The problems of the lower limit values of normal and the restricted age range were not solved. Considering the increasing age and height of our population along with the changes in working conditions, a comprehensive multi centre study on lung function of the Caucasian population should be initiated without any delay by the international respiratory societies.