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EDITORIAL

Are six seconds long enough?

''It's easier and better'' sounds like advertising hype, but in the case of six-second spirometry manoeuvres in the primary care setting, it's probably true. All one needs is a spirometer which allows selection of the correct reference values for the forced expiratory volume in one, and six, seconds (FEV1 and FEV6, respectively), and therefore the FEV1/FEV6 ratio [1]. Six-second forced vital capacity (FVC) values were first recommended in 2000 for chronic obstructive pulmonary disease (COPD) case-finding in primary care [2]. The paper by Melbye et al. in this issue [3] provides additional evidence that the FEV1/FEV6 ratio is a good substitute for the traditional FEV1/FVC value for detecting airway obstruction usually due to asthma or COPD.

Healthy children can forcefully exhale almost all of their FVC in less than three seconds. Healthy adults can do so in less than six seconds. However, children with poorly controlled asthma, and adults with COPD, often can continue to exhale for more than 15 seconds if pushed hard during spirometry testing. But for what purpose? To achieve a flat volume-time plateau, indicating an acceptable end-of-test value? Several studies from different countries, using different models of spirometers, and testing patients of all ages, confirm that for detecting airway obstruction, and for ruling out restriction of lung volumes, six-second FVC manoeuvres (when compared to appropriate reference equations) produce the same acceptable misclassification rates as traditional techniques [4—8]. This is good news, because it makes spirometry testing faster and easier for both the patient and the technologist or nurse.

The vast majority of spirometry tests performed in the primary care setting are for one of three indications: firstly, to detect airway obstruction in patients with respiratory symptoms [9,10]; secondly, to grade the severity of impairment in patients known to have asthma or COPD; and thirdly, to determine the efficacy of medications prescribed for asthma or COPD. Six-second manoeuvres only help with the first indication, since the FEV1 — which can be measured from manoeuvres which only last for one second — is used to grade severity and to determine therapeutic response from time to time.

Despite the widespread promotion of the GOLD criteria for detecting COPD in smokers [10] — an FEV1/FVC ratio < 0.70, (or its equivalent, an FEV1/FEV6 ratio < 0.73) — these fixed ratio values should not be used because they cause high misclassification rates [11,12]. The fixed ratios are also unnecessary, because all office spirometers automatically calculate the appropriate lower limit of the normal range for the FEV1/FVC value, which declines with age, as shown in Figure 4 of the Melbye et al. paper [3]. The threshold for an abnormal FEV1/FEV6 value ranges from about 0.74 in patients in their early sixties to about 0.64 for patients in their eighties. Despite decades of use, there is no evidence that tests of ''small airways disease'', such as the FEF25-75% or the new six-second FEF25-75% [13], provide better sensitivity or specificity than the FEV1/FVC or FEV1/FEV6 for the early detection of COPD or confirmation of asthma.

Physicians should work with all of their smoking patients to help them to quit, regardless of their spirometry results. Bupropion or varenicline for a

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few months will provide those patients with the best chance of success [14]. Before inhalers are considered for current or former adult smokers with respiratory symptoms who are at increased risk for COPD, spirometry should be done to confirm severe airway obstruction. A minority of patients with severe COPD (FEV1 < 50% predicted) will benefit from a long-acting bronchodilator or inhaled corticosteroids, but there is no evidence that those with mild to moderate COPD (FEV1 > 50% predicted) derive any benefit from the chronic use of expensive inhalers [15]. Patients with severe airway obstruction have a prolonged forced expiratory time (FET) greater than six seconds, which you can detect using a stethoscope and the second-hand on your wrist watch [16]. You can then confirm the severe airway obstruction (and be reimbursed for it) by performing spirometry. On the other hand, for a non-smoking patient with a history of asthma-like symptoms who is asymptomatic on the day of the office visit, a normal spirometry test does not rule out asthma.

Accurate hand-held spirometers which measure the FEV1/FEV6 ratio and use the appropriate lower limit of the normal range to detect airway obstruction have been commercially available for several years [17]. The National Lung Health Education Program (NLHEP) provides an online checklist of essential features for such office spirometers [18]. Inexpensive, self-paced software for training office staff to perform spirometry has recently become available [19]. Training and continual reviews of spirometry quality are necessary because poorly-performed spirometry risks high misclassification rates [20,21]. I propose that three-minute instructional videos for patients who are about to perform spirometry would further improve the speed and quality of spirometry testing. These could be viewed on portable DVD players or MP4 players, which are now smaller (and safer) than a pack of cigarettes.

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