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On the 2019 Spirometry Statement

To the Editor:

The awaited Standardization of Spirometry 2019 Update (1) sheds light on many aspects not entirely covered in the previous 2005 edition (2). As with the former edition, it is called to be the most referenced source for the practice of this widely used device, but some issues are still not covered.

Once more, the importance of daily calibration or verification is stressed, even though some manufacturers state that their devices do not require such controls at all. A pitfall to its fulfillment is that calibration syringes are sold as a separate accessory, so the customers do not feel they are a must. Future versions of this statement should address this subject, urging manufacturers to include syringes as part of the spirometer. Furthermore, effective quality control is a problem in some scenarios, such as inpatient facilities. Ambient conditions are often different from those in which the equipment is stored and calibrated, such as the pulmonary function laboratory. Ideally, a calibration syringe should be transported to that facility, but this is seldom done because of practical reasons. At the very least, room temperature should be checked and updated in the spirometer before testing.

Patient identification has important legal significance. In many countries, women use their husband's last names. But when they separate or divorce, their last name changes and another identification may be created, which means that trend reports and graphics cannot be accurately assembled. To avoid this, every person should be identified by their original name as it appears in their identity documents. This recommendation could also apply to public people using surnames, such as actors and politicians.

Some defects overestimate FVC or FEV_1. For example, in a maneuver with a reinhalation defect, FVC is overestimated, but FEV_1 is still valid. If rejected, a significant FEV_1 value could be missed. If not, it will be probably be ranked as the best, based on the highest sum of FVC and FEV_1, and be displayed in the final report. The software should incorporate the capacity of accepting or rejecting individual FVC and FEV_1 values coming from unacceptable maneuvers.

The statement mentions that if FEV_1 falls below 80% of the start value, the test should be terminated, but this is sometimes hard for the operator to detect, as many software programs list maneuvers according to the sum of FVC and FEV_1. This task would be easier if the maneuvers were custom sorted.

Operators must seek to obtain maneuvers of similar expiratory time before and after bronchodilator administration, and software should allow isotime readings (e.g., FEV_4 to FEV_{15}), to overcome the problem of overestimated response when forced expiratory time is significantly longer in post- than in prebronchodilator maneuvers. Another alternative is the implementation of sliding vertical bars across the volume/time graph that the operator can use to equate forced expiratory time between pre- and post-bronchodilator sets. Another issue of importance concerning bronchodilator response is that it may be present even in the absence of numerical criteria. Patients in whom cough disappears or who refer a change in the quality of their respiration after bronchodilator administration are worth a comment by the operator.

Finally, spirometry in the supine position has become a standard practice in the evaluation of patients with orthopnea, or suspected or definite neuromuscular disorders (3). A future section on the subject is desirable, along with recommendations for manufacturers to add a phase other than pre- and post-bronchodilator for better comparison between sitting and supine positions and differential indexing in databases.

Expert and evidence-based American Thoracic Society/European Respiratory Society statements have had a great effect on the unification of practice and clinical trial methodology. Most spirometry training courses worldwide are and will be based on them (4, 5). We are living in a time in which new evidence and technologies are helping to further improve this old practice, and respiratory societies are keeping the pace. ■

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Reply to Arce

From the Authors:

The comments from Dr. Arce are welcome, as they address the implementation of the 2019 update of the American Thoracic Society (ATS)/European Respiratory Society (ERS) spirometry standards (1). The ATS/ERS spirometry standards describe the basic requirements for conducting spirometry, but it is to be expected that many facilities will have internal requirements and procedures that exceed the basic quality requirements in the spirometry standards.

As the standards state, calibration verification with a calibration syringe must be performed for all spirometers, including spirometers that cannot be recalibrated in the field. The onus for having a calibration syringe available is on the facility conducting spirometry, rather than on the spirometer manufacturer. Manufacturers are not permitted to claim that calibration verification of precalibrated spirometers is not required to meet ATS/ERS Spirometry Standards. For spirometers using disposable flow sensors, one new sensor from the supply used for patient tests must pass a calibration verification each testing day, but the remaining sensors used on that day do not need to be individually verified.

The comment regarding a "reinhalation defect" causing an overestimation of FVC is well taken. The spirometry standards state that the measurement of FVC ends at the beginning of inspiration, but a reinhalation may not be detected if the patient is not wearing nose clips or if an expiration-only spirometer is being used. In these circumstances, the standards should have been more explicit in the need for the operator to be alert for a partial inhalation with continued maximal expiration and indicate that the FVC from such a maneuver is neither acceptable nor usable.

Additional analyses of spirometry data and reporting of additional variables beyond those specified in the standards is an option for those facilities that wish to include them. Many manufacturers offer the ability for a spirometry facility to add such options.

Sharing comments and concerns about the ATS/ERS spirometry standards is important in the evaluation of current standards and the development of new standards. We thank Dr. Arce for this letter. ■

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The authors are the cochairs of the official American Thoracic Society and European Respiratory Society technical statement titled "Standardization of Spirometry 2019 Update."

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