QUALITY ASSURANCE OF SPIROMETERS IN THE RURAL SETTING.

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Quality assurance of portable spirometers is often overlooked in the rural/primary care setting. A potential reason for this is that many manufacturers of portable spirometers do not advocate regular calibration or quality assurance programs. The aim of our study was to check nine SpiroCard (QRS Diagnostics, USA) spirometers, used in the rural setting, for adherence to American Thoracic Society (ATS) criteria for accuracy and precision. **Method:** The spirometers were evaluated 5 (V1), 7 (V2) and 9 (V3) months after purchase. The quality assurance program consisted of visual inspection of the equipment, a calibration check, and a volume check using a calibrated 3L syringe at fast and slow flows. All measurements were made in duplicate. The same pneumotach was used for all visits on all equipment. A dynamic check was also performed with three trained biological controls (BC) performing spirometry to ATS acceptability and repeatability criteria, the best result being quoted. **Results:** Kinks in tubing from storage were the only problem found on visual inspection. This did not appear to affect results. The volume check at V1 revealed 4/108 (3.7%) measurements to be outside of the ATS criteria for accuracy, V2 2/108 (1.9%) and V3 3/108 (2.8%). Precision errors were only observed at V3 (4/54 duplicate measures). Accuracy errors appeared to be random in nature occurring in different spirometers and modes over the visits. Three precision errors occurred in the same spirometer while performing SVC manoeuvres. Intra-laboratory coefficients of variation (CV) for BC over the visits were less than 4% for FEV1and FVC and 10% for FEF 25-75% at all sites. Inter-laboratory CV at V1, V2, V3 and over all visits were equivalent. **Conclusion:** Adherence to ATS criteria was overall good with errors appearing to be random in nature. The small inter-laboratory CV suggests that testing patients across sites using the SpiroCard should not effect clinical management.

Key words: Quality assurance, American Thoracic Society criteria
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