

10 steps to checking your spirometry result

Lindsay Zurba - Education for Health Africa,
e-mail: linds@educationforhealth.africa
Peter Stanyer - Stanyer Electroserve,
e-mail: peter@stanyersa.com



The 10-step process of checking your spirometry result, outlined in Figure 1, ensures that best practices for data validation, interpretation and record keeping are adhered to in the assessment of every spirometry test. This 10-part series briefly outlines each step, one-by-one.

STEP 2: REFERENCE VALUES AND ETHNICITY

Reference values

Reference values are predicted values against which a subject's blow is measured. Reference values are based on equations that take into account age, height and sex and, specify, both the average "predicted" value and the fifth percentile lower limit of the normal range (LLN).

Selecting reference values

A vast number of reference equations have been produced, studying different populations. To ensure consistency, the reference values used should be standardised throughout the population. All of one subject's spirometry test results should be evaluated relative to a single set of reference values, regardless of which reference set is selected.

Comparing results with a normal range

There are two methods of comparing a subject's measured values with predicted values; these are:

1. The classic 'older' way: % predicted = measured / predicted x 100
2. The new way: z-score = (measured – predicted) / standard deviation

The (LLN) z- score is a more accurate way to assess spirometric values than the fixed 80% rule. A z-score is the number of standard deviations that a certain value is above the mean value of the data set. (The z-score will be negative if the value is lower than the mean.) A spirometry value is considered too low if it is more than -1.64 standard deviations from the predicted value (which is the same as the lower fifth percentile). The advantage of the z-score is that it permits comparison of values between different populations and across ages.



Founded 22 years ago, Stanyer Electroserve is a South African-based company that provides sales, service and calibration of audiometers, spirometers and vision screeners, across the African continent. Our technicians have both the experience and the qualifications to assure you the highest quality and standards of service.

10 STEPS TO CHECKING YOUR SPIROMETRY RESULT

- | | |
|---------|-----------------------------------|
| Step 1 | Calibration and patient data |
| Step 2 | Reference values and ethnicity |
| Step 3 | Acceptability and usability |
| Step 4 | Repeatability |
| Step 5 | Lower levels of normal / Z-scores |
| Step 6 | Best test / Best Curve |
| Step 7 | Interpretation |
| Step 8 | Grading |
| Step 9 | Recording and reporting |
| Step 10 | Trends and record keeping |

Figure 1. The recommended 10-step process to ensure your spirometry result derives from best practices for data validation, interpretation and record keeping

Adjustment for race

It is well known that pulmonary function differs between ethnic groups. For a given standing height, non-Caucasian men, on the average, have longer legs than Caucasian men, and a correspondingly shorter trunk size; and therefore slightly smaller lungs, explaining most of the differences between predicted values for Caucasian and non-Caucasian men.

Most spirometers internationally 'correct' or 'adjust' for race in one of two ways: by using a scaling factor for all people not considered to be 'white'; or by applying population-specific norms. To enable the spirometer, the operator must select the race of the individual, and indicate their age, sex and height. Determination of race (or population) designation varies. All designations of race or ethnicity are based on self-report, and subjects, including bi- or multiracial individuals, should choose the racial/ethnic group that best characterises them.

It may be difficult to determine whether to apply a correction factor if the individual is of mixed ethnic background and his/her ethnic group cannot be determined. In this instance, interpretation and the final clinical decision will take this into account. If a correction factor is applied, this must be reported and must also be consistently applied in subsequent tests.



We offer a variety of occupational health-related short courses, including:

Spirometry, Audiometry, Vision, Dispensing, Wellness, HIV & Counselling, Health Risk Assessment, Family Planning, Physical Examination and Health Assessment, Occupational Health Auditing Training, and Peak Flow.