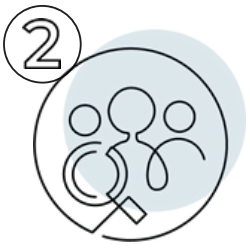
Performing Spirometry Top Tips

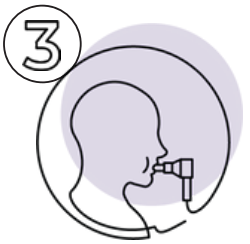
Ensure that it's safe for the patient to undergo spirometry and that the patient has prepared for the appointment[1]

Compliance with ARTP pre-test instructions should be confirmed and any deviations recorded.1



Accurately record patient demographics (height/weight/sex/age) and ethnicity[2,3]

These factors impact lung function and form the basis of predicted values. [2,4]



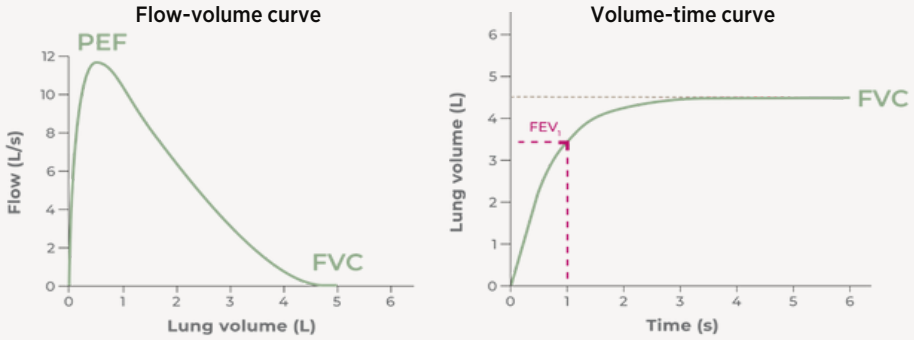
Record at least 3 relaxed and 3 forced good quality blows [2,3]

This helps to eliminate inaccurate readings. Machine quality statements may highlight invalid blows (e.g. short blow or poor effort) however, these statements should not be accepted in isolation.2,3

Review both volume-time and flow-volume curves to check for errors [2,3]

Both curves show the same blow, but errors may be seen differently on each. Common technical errors include extra breath, sub-maximal effort, cough, slow start and early stop.2,3

Normal spirometry traces[5,6]



Adapted from Seed L, et al. 2012 and CDC. 2012.[5,6]

Assess the acceptability and reproducibility of the blows, in line with ARTP criteria 1–3

Reproducibility criteria include: [1,7]

- ⩽ 150 mL between VC measurements
- ⩽ 150 mL between the best two FVC and FEV 1 measurements (or ⩽100 mL difference between if lung volume is ⩽1 L)
- A repeatable PEF for the best three blows (within 40 L/min or 0.67 L/s)

Blows must meet reproducibility criteria as a poor technique on the pre-bronchodilator attempt may be improved post-bronchodilator and assumed to be reversibility.[2]

References:

*Or FEV1 <50% with respiratory failure.10
ARTP, Association for Respiratory Technology and Physiology; COPD, chronic obstructive pulmonary disease; FEV1, forced expiratory volume in 1 second; FVC, forced vital capacity; GOLD, Global Initiative for Chronic Obstructive Lung Disease; LLN, lower limit of normal; NICE, National Institute for Health and Care Excellence; PEF, peak expiratory flow; VC, vital capacity.

1. Performance of spirometry in adults. ARTP. 2023. Available from: https://www.artp.org.uk/resources/spirometry_sop_2023 [Accessed November 2024]; **2.** Seven steps to spirometry: Management in primary care. Independent Nurse. 2020. Available from: https://www.independentnurse.co.uk/content/clinical/seven-steps-to-spirometry-management-in-primary-care [Accessed November 2024]; **3**. A guide to performing quality assured diagnostic spirometry. BTS. 2013. Available from: https://www.brit-thoracic.org.uk/media/70454/spirometry_e-guide_2013.pdf [Accessed November 2024]; **4**. Stanojevic S, et al. Eur Respir J. 2022;60(1):2101499; **5**. Seed L, et al. Respir Care. 2012;57(1):61–70; **6**. Spirometry quality assurance: Common errors and their impact on test results. CDC. 2012. Available at: https://www.cdc.gov/niosh/docs/2012-116/pdfs/2012-116.pdf [Accessed November 2024]; **7**. Sylvester KP, et al. BMJ Open Respir Res. 2020;7(1):e000575; **8**. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. GOLD. 2024. Available from: https://goldcopd.org/2024-gold-report/ [Accessed November 2024]; **9**. Rush L. Primary Health Care. 28(2):34–41; **10**. Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NG115). NICE. 2019. Available from: https://www.nice.org.uk/guidance/NG115 [Accessed November 2024]; **11**. Spirometry standards document. ARTP. 2024. Available at: https://www.artp.org.uk/write/MediaUploads/Training%20and%20Development/Spirometry/ARTPSpirometryStandardsV6Feb2024.pdf [Accessed November 2024].

This material is created and funded by Chiesi Ltd.

UK-RES-2402634 December 2024