

# Quality and adherence of home spirometry in a remote respiratory physiologist-led assessment

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## Introduction

Remote home spirometry can inform and confirm respiratory diagnosis, capture symptomatic data and address the capacity and demand mismatch within secondary care. However, limited data exists regarding the quality of and adherence to home spirometry in an adult asthma population. Previous research has found wide variation in adherence to 1 or 2 home spirometry sessions a week from 19-91% (Lechtzin et al., 2017; Althobiani et al., 2022). This study investigated the adherence to a 4 times per week home spirometry regime and measured the quality of spirometric data in a physiologist-led home assessment service.

## Methods

A group of 35 patients (6 male, 29 female) mean ( $\pm$ SD) age 47.5 ( $\pm$ 14.7) years, height 164 ( $\pm$ 8.7) cm were referred from Wirral University Hospital's severe asthma service to NuvoAir's asthma assessment service. Patients had a 12 week home lung function assessment period, performing spirometry 4 times per week and anytime they were symptomatic using the NuvoAir AirNext Bluetooth enabled spirometer and mobile app. Patients were onboarded to the service over video and phone calls with physiologists and were coached to perform independent quality assured spirometry.

## Results

Spirometry data was taken from a total of 1554 sessions performed by the patients during the assessment period. The median (IQR) engagement was 97% (68-116%). Spirometry data quality was graded A-F using ATS/ERS 2005 guidelines; 77% of spirometry tests achieved acceptable grade A-C spirometry (Figure 1), 23% were graded from D-F.

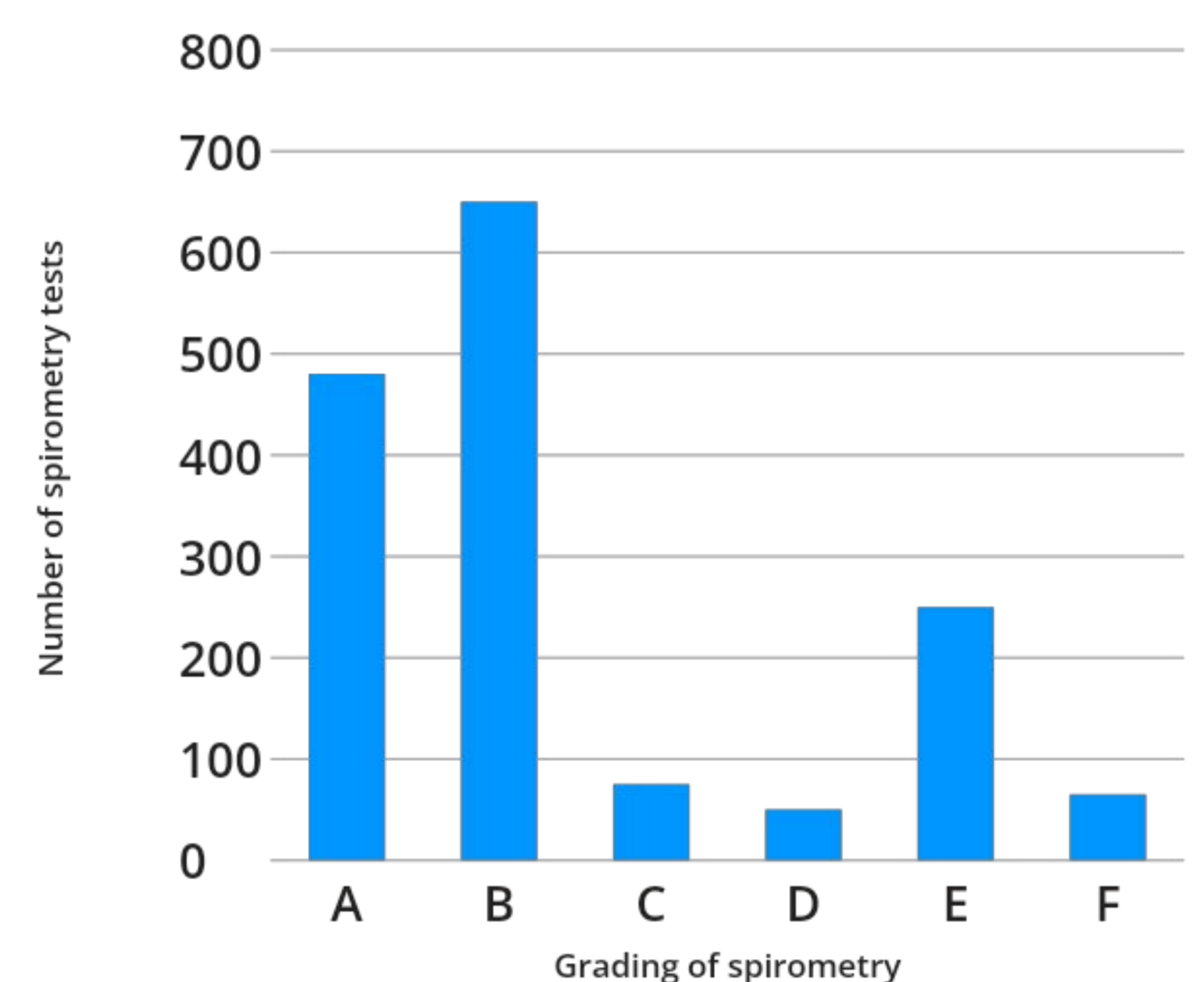


Figure 1: Bar chart showing ATS/ERS 2005 quality grading of 1554 recorded spirometry sessions.

## Conclusions

For this population of adults, grade A-C spirometry 4 times a week for 12 weeks was feasible. Unlike other home spirometry studies, this cohort received remote physiologist support which enhanced both engagement and data quality. High quality longitudinal data has the potential to provide a more detailed assessment of asthma control resulting in more informed or accelerated clinical decision making. Though this study used the ATS/ERS 2005 grading criteria, reanalysis with the updated 2019 guidelines is planned once implemented into the software. This preliminary analysis had a limited sample size and future analysis will also include more patients.



**References:** Althobiani, M.A., Evans, R.A., Alqahtani, J.S., Aldhahir, A.M., Russell, A.M., Hurst, J.R. and Porter, J.C., 2021. Home monitoring of physiology and symptoms to detect interstitial lung disease exacerbations and progression: a systematic review. *ERJ Open Research*, 7(4). Lechtzin, N., Mayer-Hamblett, N., West, N.E., Allgood, S., Wilhelm, E., Khan, U., Aitken, M.L., Ramsey, B.W., Boyle, M.P., Mogayzel Jr, P.J. and Gibson, R.L., 2017. Home monitoring of patients with cystic fibrosis to identify and treat acute pulmonary exacerbations. eICE study results. *American journal of respiratory and critical care medicine*, 196(9), pp.1144-1151.