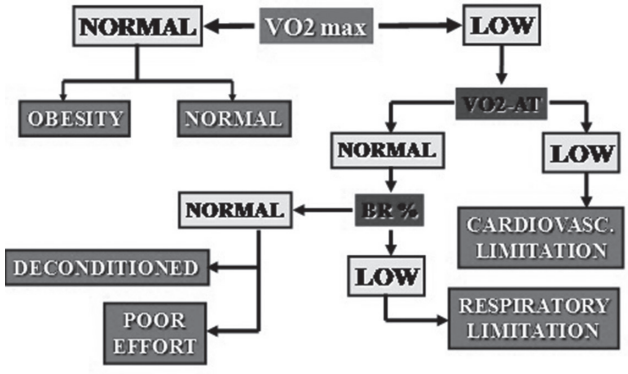

Abstract P253 Figure 1

The evidence for risk stratification is based on the oxygen consumption at anaerobic threshold (VO_2 AT) along with metabolic equivalence.[2] Attention is therefore generally paid to the numerical value of these measures rather than full interpretation of the data. Further interpretation may allow further diagnosis and optimisation of pre-existing conditions.

Methods We retrospectively applied a simple diagnostic algorithm (Figure 1) to CPETs undertaken by patients considered for major surgery in the Victoria Infirmary, Glasgow between 2014–2016.

Results The records of 39 patients who had a pre-operative CPET testing were analysed: 22 male, 17 female, age range 43–88, median 73.A total of 26 patients were classified as high risk, 23 achieved an AT <11 mls/kg/min and 3 with a metabolic equivalent <4.0mls0_2/kg/min. Both parameters were low in 13 patients. Ten patients had their procedures cancelled due to this. Eleven high risk patients had a normal VO_2 max.

Upon applying the diagnostic algorithm; 15 patients were deconditioned, 6 had cardiovascular limitation, 3 had respiratory limitation and 15 were normal.

In the 'high risk' population: 2 patients had respiratory limitation with pre-existing respiratory conditions and were cancelled. Six patients had cardiovascular limitation with 3 patients having pre-existing cardiac diagnosis, 3 were cancelled. Seven of the patients were 'deconditioned'; 5 were cancelled as a result.

Conclusion This algorithm suggests that 8 patients were considered high risk as a result of cardiorespiratory disease and a further 7 as a result of deconditioning. Appropriate speciality review and intervention or an exercise prescription pre-operatively might allow patients to improve their operative risk and therefore to proceed to major surgery.

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P254 VALIDATION OF TELEMEDICINE SPIROMETRY

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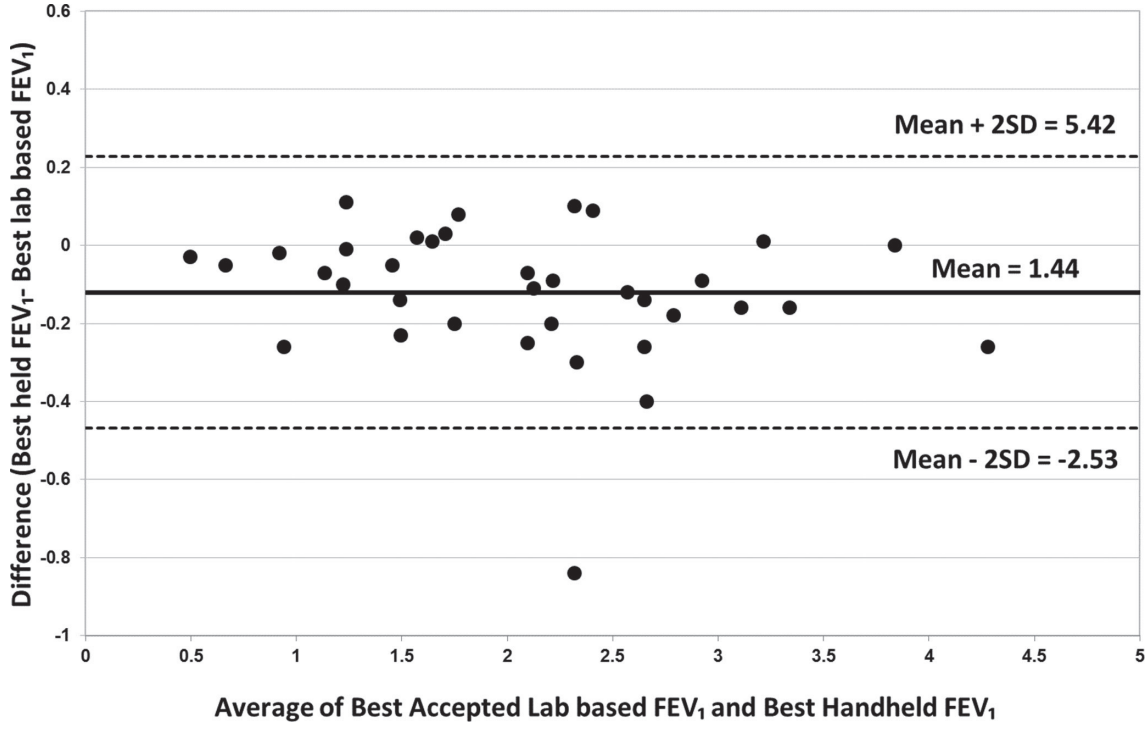
Introduction Spirometry is considered one of the most important tests for the monitoring of CF and is commonly performed at each clinic visit. With the emerging appetite for telemedicine as a viable alternative to traditional hospital outpatient visits, the suitability of an inexpensive handheld spirometer was assessed for home use.



Abstract P254 Figure 1 Bland-Altman plot

Methods We compared the accuracy of a handheld spirometer (COPD6, Vitalograph, UK) with a standard laboratory based spirometer (Spirostik, Geratherm, Germany) in 41 consecutive adult CF patients (mean age 39 years [SD 11.4], mean predicted FEV1 60% [23], 16 male) attending our regional CF centre. All were experienced at performing spirometry. They were randomly assigned to either device and carried out 3 manoeuvres before repeating the test session the alternative spirometer. Both testing sessions were supervised and performed in the same clinic room. Patient coaching and feedback was withheld from the handheld spirometry session. Intra-session analysis of flow volume tracings was carried out for lab based testing sessions.

Results Acceptable paired results were obtained in 36 patients (88%). The mean Spirostik FEV1 was 2.14L (variability 0.06 [2.3%]) and COPD6 2.02L (variability 0.09 [4.4%]); mean difference between devices 0.12L (5.6%). Eight of 36 (22%) results were lower on the handheld device.

Analysis of the flow volume tracing was required for 6 patients (16%) to either improve technique (3), or QC/eliminate artefact (3): where artefact was not eliminated, FEV1 was overestimated by 0.08 to 0.09L (~4.5%).

Conclusions The handheld device was easy to operate and accuracy and repeatability was considered to be acceptable for a telemedicine/home use application. However, differences between traditional clinic/laboratory spirometry results and telemedicine spirometry results were observed. When comparing spirometry results clinicians should have an appreciation of expected differences. Additional variables may exist where patients are unsupervised in a home setting.

P255 REPRODUCIBILITY OF LUNG CLEARANCE INDEX (LCI) IN CLINICALLY STABLE ADULTS WITH MILD CYSTIC FIBROSIS (CF)

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Background In order for lung clearance index (LCI) to be a clinically useful measurement, a better understanding is required of short-term variability. LCI-SEARCH is a longitudinal study in children and adults with CF, with LCI measured at each clinical review using a portable closed-circuit wash-in system (www.lci-search.com). Here we report initial LCI repeatability from the adult cohort.

Methods LCI measurements were performed in triplicate using a closed-circuit wash-in method (Horsley *et al*. *ERJ open*). The most recent paired LCI measurements were included providing they were within 6 months of each other, the patient was deemed clinically stable by a physician and the patient scored <2 on a 4 point respiratory symptom score. Repeatability was assessed by Bland-Altman analysis.

Results Of 40 CF adults, paired data were available on 21 (7 subjects had completed only 1 assessment, 1 withdrawn, 11 clinically unstable). These 21 subjects (14 male) completed a median of 5 LCI measurements each (range 2–11), a median of 84 (range 42–189) days apart. Mean age was 28 yrs, mean FEV1 82% predicted, 11 pancreatic sufficient, 11 had never had pseudomonas infection.

Mean (SD) LCI at visit 1 was 8.68 (2.96) vs 8.73 (2.81) at visit 2 (p = ns). Median coefficient of variation for LCI was 3.9% (visit 1) and 4.2% (visit 2). Mean change in LCI between visits was 0.05 (1% of baseline LCI). 95% limits of agreement (LOA) were −1.1 (−13.7)% to 1.0 (11.6)% of baseline LCI. In this very mild cohort, 7 patients had normal LCI (<7); exclusion of these did not substantially alter LOA (−13.9 to 13.1%). There was greater variability in FRC: mean bias −1.5% of baseline (LOA 30 to −33%).

Conclusions Even in this very mild cohort of CF adults, patients are frequently unwell or more symptomatic at routine review. Within-visit repeatability was good, and similar to previous reports. When clinically stable, LCI variability over a period of up to 6months was approximately ± 10%. Addition of more adult as well as paediatric data to this assessment will widen the applicability of these confidence intervals.

P256 RESPIRATORY MUSCLE STRENGTH MEASUREMENTS IN PRIMARY SCHOOL CHILDREN

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10.1136/thoraxjnl-2016-209333.399

Background Previous tests of respiratory muscle strength have rarely included measurements of inspiratory pressure. As part of a study looking at ethnic differences in respiratory muscle strength, we have measured maximum inspiratory and expiratory pressures in primary school children.

Aim We sought to determine the success rate and within-test repeatability of respiratory muscle strength measurements.

Methods We measured spirometry, height and weight and respiratory muscle strength by measuring maximal inspiratory and expiratory pressure (MIP and MEP) using Carefusion Vyntus in children aged 5–11 yr. Children breathed through a mouthpiece and pneumotachograph attached to a shutter, while wearing a noseclip. After a period of tidal breathing the child breathed in to total lung capacity and then tried to exhale forcibly against the shutter. We measured maximal (peak) expiratory pressure (MEP). For measurements of MIP, the child exhaled towards residual volume before making an inspiratory effort against the occlusion. Manoeuvres were excluded if the peak pressures were less than 3.50 kPa. We reported the largest pressures recorded, provided that the second-best was no more than 20% below the best. We calculated the percent difference between best and 2nd best manoeuvres and compared mean percentage differences in MIP and MEP.

Results Two hundred and thirty-one children were studied. We obtained MEP on 199 and MIP on 216, and paired data for MIP and MEP on 165 (87 boys and 78 girls). Overall, MIP was higher than MEP (mean (SD) MIP = 7.26 (1.92) kPa, MEP = 6.64 (1.76) kPa, p = 0.002). However, MEP tended to be bigger than MIP when the values were smaller (in the younger, smaller children) (Figure). There was no significant difference between%difference MIP and%difference MEP (mean (SD) 5.50 ± 4.29 and 4.68 ± 3.96 kPa respectively, p = 0.07).

Conclusion The success rates of MIP and MEP measurements were 94% and 86% respectively, suggesting that MIP was easier for the children to perform. The success rate for paired measurements was 71%. The repeatability of inspiratory and expiratory pressures was not different. We speculate that the change with age between which measurement was greatest (MIP or MEP) may reflect dysanaptic muscle development.