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Title: Comparison of the measurement of LCI and FRC by the NDD EasyOne ProLAB and mass spectrometry (MS)

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Body: Background: Lung Clearance Index (LCI) derived from Multiple Breath Washout (MBW) using MS and SF₆ is a sensitive measure of ventilation inhomogeneity[1]. Clinical applications of this test should increase now that ultrasonic flowmeter N₂ washout (N₂-WO) to measure LCI is commercially available but it is important to establish the relationship between these systems[2]. Aim: To compare LCI and FRC measured by the NDD N₂-WO system and a custom-built AMIS 2000 MS SF₆ system in healthy adults. Methods: MBW was performed in healthy adults using the two systems on the same day. The mean of 3 acceptable measures on each were compared. Results: 18 adults aged 19-64y completed assessments. LCI and FRC were significantly lower on the NDD system compared with MS (mean diff (95%CI): -0.4 (-0.1;-0.8) and -0.5L (-0.3;-0.7). The 95% limits of agreement were relatively wide (Fig 1).

Fig1. Bland-Altman graphs of LCI and FRC Conclusions: These preliminary results suggest that, as expected, MBW results using MS SF₆ and NDD N₂-WO are not interchangeable. Further comparative and repeatability data collection is in progress both in healthy subjects and children with lung disease to establish if the NDD N₂-WO system can discriminate lung disease from health with as much sensitivity as the MS SF₆ system. References: 1. Aurora: Thorax 2010 2. Robinson: Eur Resp J 2013.