Methods We have compared the Inspiratory Flow rate (I) with the flow metre against Maximum Inspiratory flows taken from a flow volume loop (FVI) taken as part of routine lung function testing in 100 sequential subjects attending the Cardio Respiratory department for lung function testing.

Results We have found major variability in the FVI on flow volume traces despite attempts to obtain traces with maximum volume and effort. Only 36% of subjects had variability between attempts of <1 l/s, with 64% showing variability between attempts of >1 l/s, 24% of >2 l/s, and 3% >3 l/s. For measurements using the Inspiratory Flow metre If I>2 l/s all of the 38% of subjects showed FVI of 2 l/s or more. With I of <2 l/s there was agreement between the two methods ±0.3 l/s in 26%, and a further 14% with FVI of <2 l/s. 40% of subjects with Inspiratory Flow (I) of <2 l/s had FVI of <2 l/s. But in 22% of subjects I <2 l/s but FVI >2 l/s. FVI-I showed mean difference for these subjects of 2.4 l/s (range 0.9–4 l/s). In total 78% of subjects showed concordance of Maximum Inspiratory Flow to >2 l/s or >2 l/s between the two measurements and for 22% the inspiratory flow metre reading of <2 l/s did not reflect maximum Inspiratory Flow.

Conclusion There are major variations in the Maximum Inspiratory Flow measured with a flow volume loop but for a simpler measurement with an Inspiratory Flow metre if Maximum flow is >2 l/min then it is unlikely that Inspiratory flow is compromised. A simple clinic based measurement can be useful to exclude limitation of Inspiratory Flow but if abnormal further investigation is needed.

P136 COMPARISON BETWEEN PRIMARY CARE AND SECONDARY CARE SPIROMETRY

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Introduction Spirometric testing in primary care is promoted by the QoF for GPs. The validity of such tests is questionable, due to numerous factors, including poor technique, machine maintenance and interpretive skills. The COPD Strategy supports the use of quality-assured spirometry in primary care. This study assesses the accuracy of primary care-based spirometry in referrals to our chest clinic and new Direct Access Pulmonary Function service.

Aims

1. To validate GP spirometry values with Secondary care values.
2. To identify differences in diagnosis based on physiological measurements.
3. To identify changes in severity status on COPD patients.

Method An audit was conducted, comparing Spirometry performed in Primary care (various machines and various technicians) with Spirometry performed on the Masterscreen PFT (CareFusion) in Lung Function laboratory. Where appropriate, obstructive spirometry was classified using GOLD/NICE COPD guidelines.

Results 37 patients identified.

No Spirometry results from GP = 4 (11%)

No change = 17 (46%)

Changed = 16 (43%)

Of the 16 that had their diagnosis changed:

- 5 (31%) classified as restrictive on referral, but were normal
- 4 (25%) classified obstructive on referral, but were normal
- 7 (44%) classified as normal on referral, but were obstructive

Of all referrals which were classified as obstructive (22 patients), 64% had their GOLD severity changed:

- 8 maintained their severity as classified by GP spirometry (36%)
- 8 changed by 1 GOLD stage (36%)
- 6 changed 2 GOLD stages (27%)

Conclusion For patients with COPD, the cost in treating patients varies with their disease severity. A change in severity staging would significantly alter the cost of treatment for Primary Care, by influencing the appropriate choice of treatment interventions. Correct diagnosis in primary care is fundamental to appropriate treatment and referral pathways for patients with respiratory disease. This study identifies a significant difference in physiological diagnosis achieved in secondary care and supports the need for more quality-assured pulmonary function testing.

P137 INTERPRETATION OF PLETHYSMOGRAPHY IN HEALTHY YOUNG CHILDREN

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Introduction Plethysmographic lung volumes are the gold standard for identifying restrictive lung defects (reduced TLC), and are useful for delineating obstructive defects (increased RV/TLC).[1] Interpretation of these measurements may, however, be limited without appropriate reference equations. The BTS recommend equations by Rosenthal[2] (based on white subjects) for children. However, to our knowledge, no ethnic-specific plethysmographic equations have been published for black children, in whom lower spirometric values are known to exist.

Aim To evaluate the appropriateness of plethysmographic reference equations in healthy young children according to ethnic origin.

Methods Healthy children (68 black and 115 white) aged 6–12 yrs underwent plethysmography measurements according to standardised guidelines.[1] Results were adjusted for sex and height and expressed as %predicted and z-scores using recommended equations.[2] Unpaired t-tests were used to establish ethnic differences.

Results Ethnic differences in lung volumes were dependent on the outcome: Black children had significantly lower FRC (~6% or 0.3z) and TLC (~8% or 0.6z), but no significant differences in RV such that their RV/TLC ratio was significantly higher (Abstract P137 table 1). In addition, relatively poor agreement between observed vs predicted FRC was seen in healthy white children. To avoid misdiagnosis, the limits of normality (mean±2 SD) need to be adjusted to cater for these discrepancies. These preliminary data suggest that, based on the Rosenthal equations, the lower limit of normal for TLC, (to detect restriction), would be ~75% predicted (−2.1z) for black children and ~80% predicted (−1.7z) for white children. For detecting hyperinflation using RV/TLC the upper limit of normal would be ~148% predicted (2.3z) for black children and ~135% predicted (1.7z) in white children, whereas for FRC they would be ~111%predicted (0.4z) and 122% predicted(1.2z) in black and white children respectively.

Abstract P137 Table 1 Comparison of plethysmographic outcomes between 68 healthy black and 115 healthy white children

	Black mean (SD)	White mean (SD)	Mean diff (95% CI) (black−white)
N (% male)	68 (46%)	115 (45%)	
Age (yr)	10.0 (1.5)	8.9 (1.7)	1.1 (0.6 to 1.5)**
FRC % pred	86.2 (12.6)	91.2 (15.4)	−5.8 (−10.1 to −1.4)*
FRC z-score	−0.7 (0.6)	−0.4 (0.8)	−0.3 (−0.5 to −0.1)*
RV % pred	103.7 (20.0)	99.0 (23.4)	4.7 (−2.0 to 11.4)
RV z-score	0.1 (0.7)	0 (0.8)	0.2 (−0.1 to 0.4)
TLC % pred	94.2 (9.8)	101.7 (11.0)	−7.5 (−10.6 to −4.3)**
TLC z-score	−0.5 (0.8)	0.1 (0.9)	−0.6 (−0.9 to −0.4)**
RV/TLC % pred	110.2 (19.0)	96.9 (19.0)	13.2 (7.5 to 19.0)**
RV/TLC z-score	0.5 (0.9)	−0.1 (0.9)	0.6 (0.3 to 0.9)**

*p<0.05, **p<0.0005.