

European Respiratory Society Annual Congress 2013

Abstract Number: 5456

Publication Number: 1790

Abstract Group: 9.1. Respiratory Function Technologists/Scientists

Keyword 1: Spirometry **Keyword 2:** Physiological diagnostic services **Keyword 3:** Epidemiology

Title: Appropriate interpretation of longitudinal spirometry assessments

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Body: Introduction: Recommendations for spirometry interpretation have used reference equations based on white subjects switching from paediatric to adult ranges after 18 years of age, with limitations previously described. Aims: In 2012, the Global Lung function Initiative (GLI) released reference equations providing a continuous equation from 3 to 95 years and adjusting for ethnic differences. This case study compared spirometry based on Rosenthal/ECCS with GLI predicted equations. Methods: Seventeen spirometry assessments performed in a Black subject (age 12-18y) with Juvenile dermatomyositis (JDM) were expressed as % predicted using the Rosenthal (<18y) and ECCS (>18y), without ethnic adjustment, compared with the Black-specific GLI equations. Results: FEV₁ % predicted was up to 9% higher using GLI compared with old standards.

After 18y there was an increase in FEV₁ by 100mL, reflected by the increase in GLI % predicted, whereas ECCS reference data showed a reduction in FEV₁ % predicted by 2%, due to switching from paediatric to adult equations. If a fixed "normal" threshold of 80% predicted had been applied, the subject would have been misdiagnosed on 6 occasions. Conclusion: Failure to adjust for ethnicity and using discontinuous equations can lead to spirometry misinterpretation and misdiagnosis when the 80% predicted cut-off for abnormality is used. The advantages of using GLI 2012 reference equations has been demonstrated.