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Title: Classification of PFT data using global lung initiative (GLI) and national health and nutrition examination survey (NHANES-III) models when extrapolated beyond the NHANES-III limit of 80 years of age

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Body: RATIONALE: The National Health and Nutrition Examination Survey-III (NHANES-III) equations provide predicted normal values (Pred) and lower limits of normal (LLN) for patients up to 80 years of age. Extrapolation beyond 80 years can yield physiologically impossible predictions (a short older person may have negative LLN). The Global Lung Initiative (GLI-2012) prediction equations extend to 95 years. METHODS: We used clinical spirometry data from Intermountain Medical Center and LDS Hospital patients (Salt Lake City, Utah) from 2001-2012. We analyzed data from 80-95 year old Caucasian patients. We used the NHANESIII (Hankinson et al. 1999) and the GLI-12 predictions (Quanjer et al. 2012) to calculate the Pred and LLN for FEV₁, FVC, and FEV₁/FVC. We compared the categorization of clinical spirometry data for NHANES-III and GLI-12. RESULTS: We studied 1,699 spirograms from 80-95 year old Caucasian patients (1107 males, mean age 84.4, SD 2.98 and 592 females, mean 84.67, SD 3.11). Pred and LLN values were similar for both NHANES-III and GLI-12. Differences appear gender and height dependent. For FEV₁/FVC, the GLI values (vary with height) appear non-linear while the NHANES-III values appear linear (height invariant). We observed differences in normal/abnormal patient categorizations for FEV₁, FVC, and FEV₁/FVC when comparing NHANES-III and GLI equations. the largest was 18% different categorization for FVC. CONCLUSION: We observed differences between NHANES-III and GLI-12 categorization, with GLI-12 equations categorizing 18% more normal FVCs than NHANESIII for 80-95 yr olds.