

THE RELATIONSHIP OF NUTRITIONAL STATUS AND BODY COMPOSITION TO  
MAXIMAL EXERCISE CAPACITY IN ADOLESCENTS WITH CYSTIC FIBROSIS  
MATCHED TO HEALTHY YOUTH.

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Malabsorption and increased respiratory work in adolescents with Cystic Fibrosis (CF) contributes to malnutrition, fluid-electrolyte imbalances, increased energy expenditure, reduced physical activity, and increased mortality. The **purpose** of this study was to compare nutritional status and body composition (BMI, % ideal wt/ht, stature and weight per age CDC growth charts, percent body fat and water, lean mass and bone density) to maximal exercise capacity in CF adolescents, matched to healthy subjects by age, gender, race, Tanner stage, height and weight. **Methods.** The **sample** was 20 adolescents [10 CF (mean FEV<sub>1</sub> 73% predicted) & 10 non CF (mean FEV<sub>1</sub> 91%], aged 10-22 years. Data collection was done in the Clinical Research Center and Radiology Dept at Wake Forest University Medical Center and UNCG's Human Physiology Lab. **Measures.** Maximal exercise capacity was assessed using continuous, open-circuit indirect calorimetry (Sensormedics® Vmax229) and a cycle ergometer. Body composition was measured by body mass index (BMI) calculated as wt kg/ht cm<sup>2</sup>, % ideal weight /height calculated from CDC growth charts, skinfold thicknesses at 9 sites using Harpendon calipers by a trained anthropometrist, multifrequency bioelectrical impedance (BIA) to measure body water and % fat using a Xitron Hydra ECF/ICF Model, and a total body DEXA (Dual Energy Absorptiometry) by a radiology technician to determine muscle, bone, fat and water composition. Pulmonary function (FEV<sub>1</sub>), O<sub>2</sub> saturation, and blood glucose were also measured. **Findings.** Difference scores were obtained between matched pairs. Data were analyzed by Wilcoxon Signed rank test. No differences between CF and healthy subjects were found in age, gender, and Tanner stage. CF subjects have delayed growth, and height & weight were lower, but BMI was not different between pairs. All but one of the CF subjects had lower % ideal body wt/ht than the matching person; two CF subjects were underweight, and two had mild to moderate malnutrition. Percent body fat by skin folds was significantly less in CF subjects. However, with BIA, % body fat was

Item			Item			Significance
	CF	Non-CF		CF	Non-CF	
Age	14.5	13.8	% fat-SF	13.9	17.8*	*(p <0 .05)
Height (cm)	155.5	161.7*	% fat-BIA	27.7	27.3	*(p <0 .05)
Weight (kg)	44.4	50.5*	TBW-BIA	24.5	27.7*	*(p <0 .05)
BMI	18.0	19.0	ECF-BIA	11.0	12.3*	*(p <0 .05)

not different, but total body water and ECF were significantly less in the CF subjects, indicating mild dehydration. Maximal exercise capacity was significantly lower in the CF subjects, 30.6 ml/kg/min vs. 40.6 ml/kg/min, p = 0.03. Data analysis is still in progress.

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