

## Sex and age differences in aerobic fitness in people with cystic fibrosis

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**Objective:** A high exercise capacity (VO<sub>2</sub>) is known to be a predictor of mortality independent of lung function for people with CF (PwCF). Whilst VO<sub>2</sub> has been shown to be significantly different between sexes in healthy children, it is unclear what the effects of age and sex are for VO<sub>2</sub> in PwCF. This aim of the study was to characterise CPET results for PwCF.

**Methods:** Eighty-nine people with CF (53 male/36 female; age range 9-69 y; paediatric (< 18 y = 31, Adult ≥18 y = 58; ΔF508/ΔF508 = 38, ΔF508/Other = 46, No ΔF508 = 10) were included. CPET using a combined ramp-incremental and supramaximal verification cycle ergometer test determined maximal oxygen uptake (VO<sub>2</sub>). Absolute, relative to body mass and allometrically scaled VO<sub>2</sub> were derived. One way ANOVA with Bonferroni post-hoc tests compared age and sex differences.

**Results:** Mean (SD) absolute VO<sub>2</sub> male (n=19) and female (n=12) paediatrics were 2.19 (0.84) and 1.31 (0.34) L·min respectively and adult males (n=34) and females (n=24) were 2.12 (0.66) and 1.44 (0.36) L·min respectively. Mean (SD) relative VO<sub>2</sub> for male and female (n=12) paediatrics were 38.9 (6.3) and 28.6 (5.4) mL·kg<sup>-1</sup>·min respectively and adult males and females were 28.4 (9.1) and 22.7 (5.0) mL·kg<sup>-1</sup>·min respectively. Mean (SD) allometrically scaled VO<sub>2</sub> for male and female paediatrics were 79.6 (14.9) and 56.8 (10.3) mL·kg<sup>-1</sup>·min and adult males and females were 61.6 (19.4) and 47.9 (10.4) mL·kg<sup>-1</sup>·min respectively. A significant main effect for sex (P< 0.01) but no age (P=0.82) or interaction (P=0.48) effect was found for absolute VO<sub>2</sub>. Relative and allometrically scaled VO<sub>2</sub>, significant sex and age main effects (P< 0.01) but no interaction effects were found (P=0.16 and P=0.20).

**Conclusion:** Mean female VO<sub>2</sub> scores were significantly lower than males irrespective of age and paediatric scores were significantly higher than adults. Of concern is the significantly reduced scores in adulthood for females.