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L'Animal et l'Homme, une même santé



### 57. Measured and predicted oxygen uptake in healthy adults

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Measurement of maximal oxygen uptake ( $\dot{V}_{O_{2max}}$ ) is considered to be the gold standard (GS) to determine aerobic capacity in human. Its determination is not easy to perform in untrained or unhealthy individuals. Several tests are designed to predict  $\dot{V}_{O_{2max}}$  while reducing the risk and costs linked to its direct measurement. Among them, the one-mile track walk test (1 mile-WT) does not require specialized equipment. Also, a non-exercise based-equation model (NE-BEM) has been proposed to estimate  $\dot{V}_{O_{2max}}$  in healthy individuals. This study tests the validity of the 1 mile-WT and NE-BEM to estimate  $\dot{V}_{O_{2max}}$  in a group of healthy adults.

All 12 participants performed a maximal graded exercise on a treadmill up to exhaustion. Expired air during exercise was analyzed (Cosmed K4b<sup>2</sup>) for O<sub>2</sub> content. The test began at a speed of at 7 km/h for 5 minutes to be increased by 2 km/h every 3 minutes. For the 1 mile-WT, participants were instructed to walk as fast as possible. The time to perform 1 mile was included in an equation to predict  $\dot{V}_{O_{2max}}$  taking into account individual characteristics and final heart rate (HR). The NE-BEM estimates  $\dot{V}_{O_{2max}}$  based on a calculation including gender, age, body mass index, resting HR, and self-reported physical activity. Six statistical methods were used to estimate level of agreement between measured and estimated  $\dot{V}_{O_{2max}}$  values.

The mean ( $\pm$ SD)  $\dot{V}_{O_{2max}}$  was  $41.2 \pm 4.1$  with the GS vs  $44.6 \pm 5.4$  and  $34.7 \pm 5.1$  mL.kg<sup>-1</sup>.min<sup>-1</sup> as estimated by the 1 mile-WT and the NE-BEM, respectively. There was no agreement between the tests. Estimating  $\dot{V}_{O_{2max}}$  in a group of non-homogenous individuals was not valid using the prediction equations referenced in the literature.