

# Longitudinal Assessment of Cardiorespiratory Function in Saudi Youth: An 11-Year Follow-Up Study

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## Introduction:

A number of research studies indicate that contrary to a short period of time (5 years or less), tracking of cardiorespiratory fitness from childhood to young adulthood over a longer period declines considerably. About 11 years ago, we had collected cardiorespiratory data for a group of Saudi children between the ages of 7 and 12 years. The purpose of this study, therefore, was to present follow-up data on maximal cardiorespiratory function in Saudi young males, and to examine tracking coefficient over an 11-year period.

## Methods:

Subjects were 31 young males from a predominantly middle-class with good nutritional status. They were tested twice, at baseline (T1), with a mean age (SD) of 9.5 (1.5) years, and at a follow-up test (T2), with an average age of 20.5 (1.7) years. Graded treadmill running protocol with a constant speed and an incremental elevation was used. An open-circuit spirometry system was utilized for respiratory and metabolic data collection.

## Results:

Paired samples t-test indicated significant increases in body mass (150%), lean body mass-LBM (120%) and fat percent (66.5%) from T1 to T2. There were no significant changes between T1 and T2 in maximal heart rate, VO<sub>2</sub> max relative to body mass, VO<sub>2</sub> max relative to LBM, or Ventilatory efficiency (VE max/ VO<sub>2</sub> max). However, there were significant increases at T2 compared with T1 in VO<sub>2</sub> max relative to body surface area-BSA, and in O<sub>2</sub> pulse index. In addition, VO<sub>2</sub> max scaled to 0.67 or 0.75 of body mass increased significantly by 20% and 29%, respectively. Ventilatory anaerobic threshold (VAT) relative to body mass decreased significantly from T1 to T2 by 13%. Furthermore, Pearson correlation analyses of cardiorespiratory function relative to body mass revealed considerably low tracking coefficients over the 11-year period, ranging from 0.056 for VO<sub>2</sub> max relative to body mass to 0.269 for maximal heart rate, as shown in table 1.

Variable	T1	T2	Correlation of T1 with T2
VO <sub>2</sub> max (ml/kg. min)	48.4 (6.1)	48.3 (7.9)	0.054
VO <sub>2</sub> max (ml/kg. LBM. min)	57.6 (8.2)	62.0 (10.4)	0.176
VO <sub>2</sub> max (L/min. m <sup>2</sup> )	1.38 (0.24)	1.84 (0.23) **	0.196
VO <sub>2</sub> max (ml/kg.0.67 min)	151.0 (25.1)	194.9 (28.1) **	0.056
VO <sub>2</sub> max (ml/kg.0.75 min)	115.4 (18.3)	138.9 (21.5) **	0.056
O <sub>2</sub> Pulse Index	6.99 (1.14)	9.18 (1.14) **	0.207
VAT(ml/kg. min)	33.3 (4.1)	28.8 (5.6) **	0.162
HR max (bpm)	197 (6)	200 (8)	0.269

Table 1: means (SD) of cardiorespiratory function at T1 & T2. (\*\* p < 0.01)

## Conclusion:

It can be concluded that VO<sub>2</sub> max relative to body mass remained almost the same from childhood to young adulthood in Saudi males. However, VO<sub>2</sub> max expressed relative to BSA or raised to body mass to the power of 0.67 or 0.75 increased significantly during the same period. Furthermore, Tracking of cardiorespiratory fitness over an 11-year-period from childhood to young adulthood was low.

## References:

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