CS7.

PREDICTION OF MAXIMAL OXYGEN UPTAKE FROM SUBMAXIMAL TESTS

P. BALASURIYA, D.R. ATAPATTU, B.M.O. BANDARA AND W. MOHOTTI

Department of Physiology, Faculty of Medicine, University of Peradeniya, Sri Lanka

Maximal oxygen uptake (VO_2 max) has been recognised as the best index of aerobic fitness. In Sri Lanka, the Astrand nomogram has been used in several studies to determine VO_2 max. In the present study, VO_2 max is predicted by extrapolation from the subject's own responses to submaximal exercise.

The subjects comprised 13 sedentary, male volunteers with a mean age of 25.1 years (SD 2.7). Each subject exercised on a treadmill at 4 graded speeds. The steady state heart rate and the oxygen uptake were determined for each speed using standard techniques. The heart rate/ oxygen uptake relationship was extrapolated to the subject's predicted maximal heart rate to determine VO_2 max.

The mean ± SD for VO_2 max was found to be 35.8 ± 7.4 ml kg^{-1} min^{-1}. This is not significantly different ($p > 0.1$) from values obtained for similar subjects using the Astrand nomogram (mean ± SD 39.0 ± 5.9). These values are below reference values for young adult males (42 ml kg^{-1} min^{-1}).

The correlation of oxygen uptake with running speed and heart rate were highly significant ($r = 0.998$, $p < 0.001$ for both).

Such graded exercise tests are used i. to determine the oxygen cost of running at a given speed (running economy) which is used to assess training in athletes and ii. for exercise prescription in subjects and patients.