Title	Anaerobic fitness of young people
Author(s)	Michael Chia
Source	*NIECER Research Bulletin, 4*(1), 11-12
Published by	National Institute of Education Centre for the Educational Research, Nanyang Technological University, Singapore

Citation: Chia, M. (1999). Anaerobic fitness of young people. *NIECER Research Bulletin*, *4*(1), 11-12.

Anaerobic Fitness of Young People

Asst. Prof. **Michael** *Chia, School* **of** **Physical** *Education, NIE*

It is paradoxical that less should be known about the anaerobic function of young people in comparison to the abundant information available on their aerobic function, given that both play integral roles in the natural habitual physical activities of young people. Although the metabolic demands of supra-maximal exercise are similar in both adults and young people (i.e. adenosine triphosphate is needed at a rapid rate to sustain the level of exercise), the physiological responses of young people to this type of exercise are markedly different from those of adults. This is not surprising since children are not adults packed into small bodies, It is imperative that more research into young people's anaerobic fitness is conducted to provide a more comprehensive understanding of the capabilities of the exercising child.

This thesis examined the development of anaerobic fitness of British young people between the ages of 10 and 17 years by juxtaposing the results of Studies I and IV. Both peak power (PP) and mean power (MP) in the Wingate Anaerobic Test (WAnT) increased greater than the corresponding increases in body m'ass with age. The tempo of the development of anaerobic fitness between the sexes was different and by age 17 years, the boys were significantly more powerful than the girls, despite no sex differences in post-exercise blood lactate concentration. The stability of anaerobic fitness between the age of 10 years and 14 months later was high, but

there was poor tracking of fitness among subjects between ages 12 and 17 years. Allometric modelling of the longitudinal data revealed mass exponents that were markedly different from 1.0, demonstrating that the conventional use of simple ratio standards to model the data was inappropriate. Sample-specific allometric modelling of data is recommended as a viable alternative in describing the longitudinal development of anaerobic fitness in young people.

Study II examined the protocol issues in the WAnT. Results indicated that power adjusted for the inertia of the ergometer was seven to 20% greater than the unadjusted value; power averaged over one second was eight to 12% greater than power averaged over five seconds; the percentage aerobic contribution over a WAnT20 seconds was lower than over a WAnT30 seconds (14-36% vs. 18-44%) for assumed mechanical efficiency values of 13 and 30%; and that post-WAnT blood lactate concentration in both sexes peaked by two minutes.

Studies IIIA and IIIB examined the aerobic-anaerobic nexus and the WAnT performances in relation to thigh muscle volume (TMV) as determined using a magnetic resonance imaging technique. Results demonstrated that young people's WAnT oxygen uptake amounted to 71% of peak over WAnT30 seconds compared to 61% of peak over WAnT20 seconds; when body mass or TMV was statistically controlled for, there was no significant relationship between peak and WAnT power. WAnT power allometrically modelled to either body mass or TMV was more appropriate, indicating that sample-specific allometric modelling of data is preferable to the use of simple ratio standards.

The *PhD* was *awarded by the University of Exeter, U.K.*