

Yeadon, M.R. and Morlock, M. 1989. The appropriate use of regression equations for the determination of segmental inertia parameters from anthropometric measurements. *Journal of Biomechanics* 22, 6/7, 683-689.

Linear regression equations are commonly used in conjunction with experimental data to provide linear relationships between quantities which are dimensionally distinct. In many cases theoretical relationships between such quantities are known and can be used as a basis for non-linear regression equations. This study compares linear and non-linear approaches for estimating the segmental moments of inertia from anthropometric measurements using the data of Chandler *et al.* [Chandler *et al.* (1975) Investigation of inertial properties of the human body. AMRL Technical Report 74-137, Wright Patterson Air Force Base, OH.] Right limb data were used to derive the equations while left limb data were used as a cross-validation sample to evaluate the inertia estimates calculated from the equations. For the limb segments the standard error estimates had average values of 21% for the linear equations and 13% for the non-linear equations. Data on a 10 yr-old boy was used to compare the two approaches outside the sample range. The mean percentage residuals were 286% for the linear equations and 20% for the non-linear equations. A set of non-linear equations is provided.