Format: Abstract

Comprehensive non-dimensional normalization of gait data.

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Abstract

Normalizing clinical gait analysis data is required to remove variability due to physical characteristics such as leg length and weight. This is particularly important for children where both are associated with age. In most clinical centres conventional normalization (by mass only) is used whereas there is a stronger biomechanical argument for non-dimensional normalization. This study used data from 82 typically developing children to compare how the two schemes performed over a wide range of temporal-spatial and kinetic parameters by calculating the coefficients of determination with leg length, weight and height. 81% of the conventionally normalized parameters had a coefficient of determination above the threshold for a statistical association ($p < 0.05$) compared to 23% of those normalized non-dimensionally. All the conventionally normalized parameters exceeding this threshold showed a reduced association with non-dimensional normalization. In conclusion, non-dimensional normalization is more effective that conventional normalization in reducing the effects of height, weight and age in a comprehensive range of temporal-spatial and kinetic parameters.

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