Multiplier Method for the Prediction of Sitting Height and Spinal Height

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Purpose: The purpose of this study is to develop multipliers for the spine and for sitting height that predict spinal height and sitting height at maturity.

Methods: Using cross-sectional and longitudinal clinical databases, we divided the total sitting height, cervical length, thoracic length, and lumbar length at skeletal maturity by the sitting height, cervical length, thoracic length, and lumbar length at each age for each percentile given. These multipliers were then compared with each other, compared between percentiles, and compared between different racial, national, and ethnic groups.

Results: The multipliers calculated for sitting height had little variability and correlated with those calculated for the thoracic and lumbar spinal heights. The cervical spinal multipliers were nearly identical to the multipliers for the upper extremity. The multipliers of different racial, national, and ethnic groups were also the same.

Conclusions: The multiplier method has been proven to be independent of percentile, generation, ethnicity, and race. It is a simple and effective method of predicting spinal height and sitting height. The multiplier for sitting height can be used to predict sitting height at maturity, the heights of the cervical, thoracic, and lumbar spine, and the height lost as a result of spinal fusion.

Significance: The sitting height multiplier will determine a child's sitting height at maturity. Additionally, the total height lost as a result of spinal fusion can easily be determined by using both the spinal and sitting height multipliers.