

New growth monitoring tools enable better detection of growth disorders in children

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Children's growth disorders can be detected earlier and more efficiently with the help of new growth monitoring tools, according to research from the University of Eastern Finland. These tools include up-to-date growth reference curves, evidence-based screening cut-off values for abnormal growth and automated growth monitoring based on electronic health records.

Since the 1990s, Finnish child welfare clinics have been using a globally unique method for growth monitoring, resting largely on growth reference curves. This screening process relies also on important tools such as screening cut-off values for abnormal growth and accurate diagnostic procedures for early detection of growth disorders. However, due to changes in children's growth over time, growth charts need regular updating. Furthermore, the screening criteria have left room for improvement and research evidence on the efficiency of growth monitoring has been lacking. In his doctoral thesis, Antti Saari, MD, revised the growth monitoring system of Finnish children and demonstrated the benefits of systematic growth monitoring for the detection of growth disorders.

Revised national growth charts detect disorders better than WHO charts

The study defined new growth reference curves for Finnish children by making use of auxological data from approximately 72,000 children.

Healthy children born between 1983 and 2008 were found to be growing taller than children in the former Finnish growth reference dating back approximately 40 years, consisting of children born in 1956-1973. The mean adult height of Finnish boys has increased from 178.9 cm to 180.7 cm (+1.8 cm), and the mean adult height of Finnish girls from 165.6 cm to 167.5 cm (+1.9 cm). The study also published BMI-based growth reference curves for Finnish children.

Revised growth reference curves enhance the detection of growth disorders causing growth failure. The study also showed that if Finland was to use the multi-ethnic WHO growth charts instead of the updated national ones, many disorders affecting growth could go undetected.

More accurate and automated screening

Cut-off values determining healthy vs. [abnormal growth](#) are used to supplement the growth reference curves. The study determined evidence-based cut-off limits for attained height, weight and growth rate, and validated these against two target conditions: Turner syndrome and celiac disease. The study discovered that the screening precision was excellent for Turner syndrome, and good for celiac disease.

Furthermore, new monitoring methods can help in the early detection of [growth disorders](#). It is possible to automatize the new growth monitoring methods developed in the study by using [electronic health records](#) and growth monitoring software.

Electronic health records remain an underused diagnostic tool in [primary health care](#). The study showed that computer-assisted growth monitoring clearly enhanced monitoring precision in primary health care when combined with automated growth consultation services used in special health care. The automated strategy improved the detection precision by approximately six-fold and often also allowed for a considerably earlier detection of disorders affecting growth than the traditional manual

method.

Provided by University of Eastern Finland

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