

Simple physical test identifies which children are more likely to suffer from cardiovascular diseases in the future

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Credit: University of Granada

An international study coordinated by the University of Granada (UGR) has shown that the level of aerobic capacity of children and adolescents, which can be assessed with a simple physical test called a 'shuttle run test,' is an excellent marker for identifying those with an increased risk of suffering from a cardiovascular disease or myocardial infarction in the future.

The work, which has been published in the *British Journal of Sports Medicine*, was coordinated by Jonatan Ruiz, Ramón y Cajal researcher at the Department of Physical Education and Sports of the UGR. It's a new systematic review and meta-analysis in which the researchers reviewed seven studies involving more than 9,000 children and adolescents aged 8 to 19 from 14 countries.

The research proves the utility of [aerobic capacity](#) cut points, which are assessed with the so-called '20-meter [test](#)' or 'shuttle run test,' consisting of running at a progressively increasing speed. The test can be evaluated at the school by a [physical education](#) teacher.

"Below recommended fitness levels (maximum oxygen consumption of 42 and 35 mL/kg/min for boys and girls, respectively) should raise a red flag," says Jonatan Ruiz.

"Although this proficiency test is widely used in schools and provides us with valuable health information, physicians and health professionals who assess the risk of present or future cardiovascular diseases for those ages are yet to adopt these rules," says the UGR researcher.

The authors of this study warn that it is necessary to establish international standards related to aerobic capacity similar to those used to determine overweight or obesity.

The results of the research revealed that the percentage of children and adolescents at risk of suffering from a [cardiovascular disease](#) ranged from 6 percent to 39 percent for boys and from 6 percent to 86 percent for girls.

Boys with a level of aerobic capacity above 42 mL/kg/min had a 5.7 times greater likelihood of having cardiovascular disease, a figure which in the case of girls resulted in that above 35 mL/kg/min they were 3.6

times more likely to be at risk.

The 20-meter test is currently used in most schools in Spain, as well as in many European countries, to measure the aerobic capacity of children.

This research has determined that the test also determines which [children](#) have worse cardiovascular health and should undergo an intervention program for improvement.

More information: Jonatan R Ruiz et al. Cardiorespiratory fitness cut points to avoid cardiovascular disease risk in children and adolescents; what level of fitness should raise a red flag? A systematic review and meta-analysis, *British Journal of Sports Medicine* (2016). [DOI: 10.1136/bjsports-2015-095903](#)

Provided by University of Granada

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