

Study: Waist circumference, not BMI, is best predictor of future cardiovascular risk in children

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A new long-term study published by researchers at the University of Georgia, the Menzies Research Institute in Hobart, Australia and the Murdoch Childrens Research Institute in Melbourne, Australia suggests that waist circumference, rather than the commonly used body mass index measure, is the best clinical measure to predict a child's risk for cardiovascular disease and diabetes later in life.

The researchers, whose results appear in the early online edition of the International Journal of Obesity, found that children with high [waist circumference](#) values (in the top 25 percent for their age and sex) were five to six times more likely than children with low waist circumferences (in the bottom 25 percent) to develop metabolic syndrome by early adulthood. Metabolic syndrome is a cluster of key [cardiovascular risk factors](#) and is associated with an increased risk of subsequent [coronary artery disease](#), stroke and type 2 diabetes.

"We wanted to identify which clinical measure of childhood body composition best predicts long-term cardio-metabolic health risks," said study lead author Michael Schmidt, an assistant professor in the UGA department of kinesiology, part of the College of Education. "We were able to compare a wide range of body composition measures and found that waist circumference seems to be the best measure to predict subsequent risk."

Schmidt said that the findings should help clinicians measuring body composition identify children most at risk for future health problems in a simple and cost effective manner.

The study used data collected as part of a 20-year follow up of 2,188 Australians who participated in a national childhood health and fitness survey in 1985, when aged 7 to 15 years. As adults, they then attended one of 34 study clinics held across Australia between 2004 and 2006, where they underwent a range of health and fitness assessments. Most prior studies of the long-term consequences of [childhood obesity](#) have used the [body mass index](#) (BMI), a ratio of weight to height, as the primary measure of childhood obesity, Schmidt explained. While useful, BMI doesn't distinguish between fat and non-fat weight or indicate where the fat is located. In contrast, waist circumference measurements capture the amount of fat located centrally in the body, a location that prior studies have shown to be particularly detrimental to cardio-metabolic health. "This likely explains the stronger associations we observed between waist circumference and adult metabolic syndrome," added Schmidt.

The study is one of the first of its kind to compare directly the usefulness of different body composition measures in predicting long-term cardiovascular risk, said Schmidt. In addition, prior studies that examined the extent to which childhood obesity predicts cardiovascular health in later life were conducted among historical cohorts of children lacking the extreme [body composition](#) values seen in children now. Schmidt said that while obesity levels in 1985 Australian children were also not as extreme as today's children, the study participants were exposed to all of the factors leading to the increased rates of obesity in today's young adults, such as easy access to fast food and a more sedentary lifestyle.

While Schmidt recognizes that introducing waist circumference

measurement in schools is controversial because of potential stigmatization, he said he feels it provides an opportunity for the early identification of children at higher risk for future health problems due to excess body fat.

"I think parents would want to know if their child was five to six times more likely to have early cardio-metabolic health problems," said Schmidt. "The study shows that the increased rates of obesity in contemporary children are going to have long-term consequences. We can expect that the children of today will have higher rates of diabetes and early cardiovascular disease and that these problems will begin earlier in life."

Provided by University of Georgia

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