

# Metabolic syndrome affects nearly 1 in 10 US teens

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About nine percent of teenagers may have metabolic syndrome, a clustering of risk factors that put them on the path toward heart disease and diabetes in adulthood. This shocking statistic represents some of the first concentrated efforts to define and measure metabolic syndrome in children and adolescents – a necessary starting point for combating the problem, but one that has proven even trickier in youth than it has been in adults.

With the number of obese children in the United States rising at an alarming rate, pediatricians, family practitioners and researchers are concerned about what it means to for children's future health. The U.S. cholesterol guidelines have defined the metabolic syndrome for adults who have a cluster of risk factors, including increased waist circumference (central adiposity), hypertension (or elevated blood pressure), low HDL cholesterol, elevated triglycerides and an elevated fasting glucose.

Even though these same components can be found in children, they have not been developed into a universal definition or diagnosis. In fact, they have only recently gained attention with the first publication on the syndrome by Stephen Cook, M.D., M.P.H., assistant professor of Pediatrics at the University of Rochester Medical Center, in 2003, which was based on national data from 1988 to 1994.

In the summer of 2006, a handful of national experts were convened by the National Institutes of Health with a task to define the metabolic

syndrome for children and adolescents. The Pediatric Metabolic Syndrome Working Group (PMSWG) chose to tackle this problem affecting overweight and obese youth, tapping Cook to participate. The National Institute of Child Health and Human Development, National Heart, Lung, and Blood Institute, National Institute of Diabetes and Digestive and Kidney Diseases and the National Institutes of Health Office of Rare Diseases sponsored the conference.

As part of the committee, Cook performed a study, published with a collection of reports from the working group in February's *Journal of Pediatrics*, which analyzes how many teens in the U.S. could be considered to have the metabolic syndrome based on four different definitions of it.

Based on the most recently available data from the National Health and Nutrition Examination Survey from 1999 to 2002, the study shows that the definition Cook developed in Rochester (a waist circumference at or above the 90th percentile for age and sex; blood pressure at or above the 90th percentile; a high triglyceride level at or above 10 mg/dL; a low HDL cholesterol level at or above 40 mg/dL; and an impaired glucose metabolism at or above 100 mg/dL), reveals that 2.9 million teens – 9.4 percent of teens overall, and over a third of obese teens – meet the definition of the metabolic syndrome.

The original work by Cook and colleagues published in 2003 showed only 4 percent of teens meet this definition and that the increased prevalence is driven by the rise in obesity.

Using two other well-reported definitions with more stringent cut points, the study also reports rates as low as 2 percent (or 600,000 teens); using analyses that apply the U.S. adult definitions, it reported rates of 1.8 million teens – 5.8 percent of all teens, and 25 percent of obese teens.

“Even if there is no consensus on a pediatric-specific definition, the fact that 1 in 4 obese teens meet the adult definition for this clustering of cardiovascular disease risk factors is enough of a concern,” said Cook, who is a pediatrician and adult-internist at Golisano Children’s Hospital at Strong. “Many longitudinal studies have shown that adults with this definition are at increased risk for developing type 2 diabetes, heart disease and dying prematurely from heart disease.”

While one goal of the committee was to define the metabolic syndrome in pediatric populations, the bigger picture was to recognize the importance of obesity on cardiovascular risk for pediatric populations.

“We are not saying that adolescents who meet a definition for metabolic syndrome are going to develop diabetes or have a heart attack in the next few years, but some of the longitudinal studies presented at this meeting showed they were at very high risk for developing diabetes or heart disease in their 30s,” Cook said. “When you consider all the success we’ve had with lowering the death rate from heart disease for middle aged and older adults, it’s really disheartening to see actual data showing heart disease going up in young adults.”

Cook said there have been advances in technology, pharmaceuticals and tremendous public health victories seen with reductions in tobacco use and exposure, so the increased rates in cardiovascular risk factors in young adults must be considered “the first wave of severe consequences of the modern obesity epidemic.”

Source: University of Rochester

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