



## Risk-Factor Screening Meaningful From Age Nine Onward

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December 2, 2010 (Turku, Finland) — People who are at high risk of developing subclinical atherosclerosis in adulthood can be identified from the age of nine onward, according to a new analysis of four longitudinal cohort studies [1].

**Dr Markus Juonala** (Turku University Hospital, Finland) and colleagues note that several authorities have issued guidelines and consensus statements for the assessment and management of cardiovascular risk factors in childhood, but the optimal age for risk-factor screening has previously been unknown. Hence, these results are of "direct clinical and public-health importance," they say in their paper, published online November 29, 2010 in *Circulation*. "The preventive health work against atherosclerosis should be started in childhood, as the early risk factors matter," Juonala told **heartwire**.

He and his colleagues also say that although risk factors measured before the age of nine had only weak associations with the outcome measured--carotid intima media thickness (IMT) more than 20 years later--"primordial prevention of cardiovascular disease" should begin earlier in life. In particular, the obesity epidemic among children should not be ignored, Juonala says, "because in the present study, risk factors such as dyslipidemia and high blood pressure are strongly associated with obesity, so we should by all means fight against childhood obesity."

A second paper, also published online November 29, 2010 in *Circulation* [2], further supports the establishment of good habits early in life for the primary prevention of CVD. **Dr Heikki Aatola** (Tampere University Hospital, Finland) and colleagues show that high fruit and vegetable consumption is associated with lower pulse-wave velocity (PWV)--a marker of central arterial stiffness--starting in childhood and continuing into adulthood.

### Results Support Populationwide Approach to Primary Prevention in Youth

Juonala and colleagues used data from 4380 participants in four prospective cohorts that have collected cardiovascular risk data from childhood (three to 18 years) and performed carotid IMT measurements in adulthood (age 20 to 45 years): the **Cardiovascular Risk in Young Finns Study**; **Childhood Determinants of Adult Health** study in Australia; and two from the US, the **Bogalusa Heart Study** and **Muscatine Study**.

The number of childhood risk factors (highest quintile of total cholesterol, triglycerides, blood pressure, and body-mass index [BMI]) was predictive of elevated IMT (highest decile) on the basis of risk factors measured at age nine years (odds ratio 1.37,  $p=0.0003$ ), 12 years (OR 1.48,  $p<0.0001$ ), 15 years (OR 1.56,  $p<0.0001$ ), and 18 years (OR 1.57,  $p<0.0001$ ). Associations measured with risk factors at age three and six were weaker and nonsignificant, however.

In an accompanying editorial [3], **Dr Samuel S Gidding** (Nemours Cardiac Center, Wilmington, DE) says the findings of Juonala et al "support a populationwide approach to cardiovascular risk reduction beginning in youth."

And the research is strengthened, says Gidding, by the fact that the four studies were conducted in different countries and included ethnic minorities and generally healthy children from the community. A second important message "is the identification of an age--nine years--at which the presence of a cardiovascular risk factor has definite implications for

future something (disease if you believe in subclinical atherosclerosis as an end point, or surrogate if you do not)," he says. "The rationale for screening fasting lipids in late childhood or early adolescence is supported by these data."

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However, Gidding also stresses that this finding should not preclude noninvasive assessment of BMI and blood pressure in younger children as a preventive strategy to limit worsening of these traits or pediatric screening of those at high risk for genetic defects in lipid metabolism or in other high-risk situations, such as type 1 diabetes mellitus.

And "what remains unknown," says Gidding, "is how to select those individuals who would most benefit from aggressive, pharmacological intervention to lower risk." To conduct such trials, decisions will need to be made about what are appropriate end points in youth. Is evaluation of subclinical atherosclerosis--such as IMT--or other measures of target-organ injury sufficient, or will prevention of hard end points be needed?

### **Emphasizing Lifestyle in Childhood Is Important in Primary Prevention**

The other analysis of fruit and vegetable consumption and its association with arterial PWV was also conducted in the Cardiovascular Risk in Young Finns Study. In this study, 1622 subjects were followed for 27 years from baseline (1980; subjects aged three to 18 years) with lifestyle risk-factor data available since childhood. Arterial PWV was measured in 2007 by a whole-body impedance cardiography device.

Vegetable consumption in childhood was inversely associated with adulthood PWV, and this association remained significant when adjusted for traditional risk factors. Vegetable consumption was also an independent predictor of PWV in adulthood when adjusted for lifestyle or traditional risk factors.

"We showed that high fruit and vegetable consumption was associated with lower pulse-wave velocity, a marker of arterial stiffness and an independent predictor of cardiovascular events and all-cause mortality," say Aatola et al. "These findings highlight the importance of emphasizing lifestyle as early as in childhood in the primary prevention of cardiovascular disease."

*Neither the authors nor the editorialist had any conflicts of interest to report.*

### **References**

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