

Predicting Heart Health in Children

By RON WINSLOW Wall Street Journal November 30, 2010

Has your kid had a checkup for heart disease lately?

The vast majority of heart attacks happen to people well past middle age, so a potential problem a half-century away may not be high on your list of child health-care worries. But it is well-established that heart disease begins to develop in childhood. Now, two new studies add to a burgeoning body of evidence that developing heart-healthy habits as a youngster or adolescent may have lasting benefits in adulthood.

One of the reports, based on a pooling of data from four major studies that tracked people from early childhood into their 30s and 40s, suggests that the presence of such risk factors as high blood pressure and abnormal cholesterol by about age 9 strongly predicts a thickening of the walls in the carotid or neck arteries in early adulthood. Experts consider this condition, called carotid intima media thickness, a precursor to heart attacks and strokes.

Risky Business

Four risk factors of heart disease:

- High total cholesterol
- High triglycerides or blood fats
- High body mass index
- High systolic blood pressure (the higher number)

Chances that children with these risk factors will develop early signs of cardiovascular disease as adults, by age of initial diagnosis, compared with children without risk factors:

Age 3: 1.17*

Age 6: 1.20*

Age 9 : 1.37

Age 12: 1.48

Age 15: 1.56

Age 18: 1.57

**Not statistically significant*

Source: Circulation

The second study found that children who consumed fruits and vegetables once a day had healthier arteries as young adults than those who reported eating fruits and vegetables less than twice a month. Low consumption was associated with stiffening arteries, a warning sign of future heart problems.

Both reports were led by researchers in Finland and are being published online Tuesday by the American Heart Association journal *Circulation*.

The studies have limitations, however. In both cases, the risks in early years are linked to other risks in adulthood—not to actual heart attacks or other serious events. How reliable such surrogate markers are in predicting clinically significant problems is in some dispute. Data on fruit and vegetable consumption are based on how study participants described their monthly diet, not from a rigorously controlled randomized study.

Nevertheless, says Stephen Daniels, pediatrician-in-chief at Children's Hospital, Denver, the findings "are part of an emerging and increasingly consistent picture where lifestyle starting early in life is a



Children who ate fruits and vegetables once a day had healthier arteries as young adults than those who ate them less than twice a month.

very important factor for long-term cardiovascular health." Dr. Daniels was a co-author of one of the studies.

Interest in children's heart health is driven largely by the epidemic of obesity, which has more than tripled in prevalence among children over the past three decades, according to the U.S. Centers for Disease Control and Prevention. Nearly one in five children between 2 and 19 years old is considered obese; nearly one-third are overweight or obese. Obesity is associated with unhealthy cholesterol and blood pressure and also heightens a person's risk of heart attack.

Such statistics have many heart experts worried that more than four decades of declining death rates due to cardiovascular disease, the Western world's leading killer, may unravel if the problem goes unaddressed.

Amid a flurry of new research in recent years related to the adult consequences of childhood heart risk, experts are now rewriting guidelines on how to track and treat risk factors.

"It's pretty clear that the best scenario is never to have those risk factors in the first place," says Dr. Daniels. "When you accumulate the impact of a risk factor over time, that seems to be problematic. Interrupting it early is a good concept."

In one of the new reports, researchers led by Markus Juonala, of Turku University Hospital, Turku, Finland, gathered data from four studies that tracked heart risk in total of 4,380 people at three-year intervals beginning as early as age 3 and followed them for more than two decades. In adulthood, they underwent tests to detect thickening in the carotid arteries.

Children with high levels of four markers—total cholesterol; levels of blood fats called triglycerides; a measure of body size called body mass index, or BMI; and systolic blood pressure—were considered most at risk. Researchers found that the presence of the risk factors at ages 3 and 6 had limited association at best with thickened arteries in adulthood. But beginning at age 9, the risk factors were significantly linked with evidence of disease when the carotid artery test was taken between ages 20 and 45.

The finding is consistent with other research suggesting that risk factors begin to become meaningful between ages 8 and 10, researchers said. It suggests that age range might be the time for a thorough heart-risk evaluation, says Hugh Allen, a pediatric cardiologist at the Ohio State University College of Medicine, Columbus.

Such a checkup might include measurements of BMI, cholesterol and blood pressure, as well as questions about diet, exercise and exposure to second-hand cigarette smoke, which has an impact on heart health, he says. (Some are already routine features of a well-child exam.) Unlike adults, where specific cholesterol, blood pressure and BMI targets are established, what constitutes warning signs in children depends on age and other factors.

The second study, headed by senior author Mika Kähönen, of Tampere University Hospital, Tampere, Finland, found that low consumption of fruits and vegetables in both childhood and adulthood was associated with a higher likelihood of arterial stiffness—a condition that typically develops with aging where the arteries lose their elasticity, putting a potentially unhealthy workload on the heart.

In the study, which tracked children ages 3 to 18, arterial stiffness was determined by a test called arterial pulse wave velocity that was taken in adulthood, ages 30 to 45.

Exactly how fruits and vegetables might keep arteries healthy isn't understood, but the result is consistent with other research and long-standing recommendations about the health benefits of fruits and vegetables—not to mention your mother's persistent dinner-time pleas to eat your vegetables. "It's amusing and nice when science confirms what your mother has been telling you your whole life," says Peter Belamarich, attending pediatrician at the Heart Healthy Program at the Children's Hospital at Montefiore Medical Center, New York.

Write to Ron Winslow at ron.winslow@wsj.com