

# Low fitness may indicate poor arterial health in adolescents

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A recent Finnish study conducted at the University of Jyväskylä showed that adolescents with better aerobic fitness have more compliant arteries than their lower fit peers do. The study also suggests that a higher anaerobic threshold is linked to better arterial health. The results were published in the *European Journal of Applied Physiology*.

Arterial [stiffness](#) is one of the first signs of cardiovascular disease, and adults with increased [arterial stiffness](#) are at higher risk of developing clinical cardiovascular disease. However, arterial stiffening may have its origin already in childhood and adolescence.

"In our study we showed for the first time that the anaerobic threshold is also related to arterial stiffness," says Dr. Eero Haapala, Ph.D., from the University Of Jyväskylä.

Anaerobic threshold describes the exercise intensity that can be sustained for long periods of time without excess accumulation of lactic acid. The study showed that adolescents with a higher anaerobic threshold also had lower arterial

stiffness than other adolescents did.

"The strength of determining anaerobic threshold is that it does not require maximal effort," Haapala explains. "The results of our study can be used to screen increased arterial stiffness in adolescents who cannot perform maximal exercise tests."

## Fitness and arterial health can be improved

The results showed that both peak oxygen uptake and anaerobic threshold were related to arterial stiffness in adolescents between the ages of 16 and 19 years. Genetics may explain part of the observed associations but moderate and especially vigorous physical activity improve fitness and arterial health already in adolescence.

"Because the development of [cardiovascular disease](#) is a long process, sufficiently intense physical activity starting in childhood may be the first line in prevention of early arterial aging."

The study investigated the associations of directly measured peak oxygen uptake and anaerobic threshold with arterial stiffness among 55 Finnish adolescents between the ages of 16 and 19 years. Peak oxygen uptake and [anaerobic threshold](#) were assessed using a maximal exercise test on a cycle ergometer. Arterial stiffness was measured using pulse wave analysis based on non-invasive oscillometric tonometry. Various confounding factors, including body fat percentage and systolic blood pressure, were controlled for in the analyses.

**More information:** Eero A. Haapala et al. Peak oxygen uptake, ventilatory threshold, and arterial stiffness in adolescents, *European Journal of Applied Physiology* (2018). [DOI: 10.1007/s00421-018-3963-3](#)

Provided by University of Jyväskylä

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