

Physical fitness in adolescence linked to less atherosclerosis in middle age

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Men who were physically fit when they were young had a lower risk of atherosclerosis almost 40 years later, according to a study led by researchers at Linköping University, Sweden. The findings, [published](#) in

the *British Journal of Sports Medicine*, suggest that atherosclerosis is one of the mechanisms behind the link between physical fitness and cardiovascular disease.

"Our results strengthen the notion that [physical fitness](#) is linked to health outcomes much later in life. The findings are worrying in the sense that there is a clear global trend indicating that [young people](#) are less fit now than when these study participants were young in the 1970s and 80s.

"Therefore, I believe that these findings may be even more important for those growing up now," says Pontus Henriksson, senior associate professor at the Department of Health, Medicine and Caring Sciences at Linköping University.

It is well-known that being physically unfit at a young age is linked to an increased risk of [cardiovascular disease](#) much later in life. But the mechanism behind this finding is not fully understood. An important risk marker for future cardiovascular disease is the occurrence of atherosclerosis, which involves the accumulation of plaques in the arteries.

The international research team behind the current study therefore wanted to investigate whether physical fitness in adolescence is linked to atherosclerosis much later, which in that case would indicate that atherosclerosis is a likely mechanism behind the observed link to cardiovascular disease.

In the study, the researchers linked information from the Swedish Military Conscription Register to SCAPIS (the Swedish Cardiopulmonary Bioimage Study), a large population study on heart and lung health in individuals aged 50 to 64 years. For almost 9,000 men who participated in SCAPIS, data on them at conscription at age 18 from 1972 to 1987 were also available. One of the strengths of the study

is that it is based on the general population and that the men have been followed for a long time, an average of 38 years.

The researchers examined the coronary arteries, which supply blood to the [heart muscle](#), using coronary CT angiography, CCTA. The study is the first to use this state-of-the-art technology to examine plaques in the coronary arteries in relation to physical fitness at a young age. In addition, the researchers studied two different types of plaques in the coronary arteries. Plaques with calcium deposits are easy to measure and have long been the focus.

"We measured not only calcified plaques in the coronary arteries, but also non-calcified plaques, which are considered more problematic. They may be more likely to rupture, which can cause heart attacks, and have a worse prognosis," says Ángel Herraiz-Adillo, postdoc in the same research group.

"We see in our study that both good cardiorespiratory fitness and good muscle strength in youth are associated with a lower risk of atherosclerosis in the coronary arteries almost 40 years later," says Pontus Henriksson.

The researchers also examined atherosclerosis in the large arteries from the heart up to the brain with ultrasound.

Since only men did [military service](#) in Sweden at the time, the researchers have only been able to investigate the association between physical fitness and atherosclerosis in men. It is therefore not possible to draw conclusions for women from this particular study.

More information: Ángel Herraiz-Adillo et al, Physical fitness in male adolescents and atherosclerosis in middle age: a population-based cohort study, *British Journal of Sports Medicine* (2024). [DOI:](#)

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