

Study shows increased cardiorespiratory fitness may delay onset of high cholesterol

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Men who have higher levels of cardiorespiratory fitness may delay by up to 15 years increases in blood cholesterol levels that commonly occur with aging, according to new research published today in the *Journal of the American College of Cardiology*.

Cardiorespiratory fitness is defined as the body's ability to supply oxygen to the muscles during exercise and the muscles ability to use that oxygen. It is improved through exercise or physical activity and is proven to reduce the risk of heart disease, stroke and other diseases while improving heart and lung function.

It is common for [cholesterol](#) levels to rise until around middle age and then decrease. Previous studies have found that unfavorable levels of cholesterol are important risk factors for chronic heart disease. There is also evidence to suggest that physical activity can help to improve lipid levels.

"Age-related changes in cholesterol levels are usually unfavorable," said Xuemei Sui, M.D., M.P.H., Ph.D., assistant professor at the Arnold School of Public Health at the University of South Carolina and an author of the study. "Our study sought to determine how cardiorespiratory fitness might modify the aging trajectory for lipid and lipoproteins in healthy men."

Sui and colleagues used data from the Aerobics Center Longitudinal Study to assess levels of total cholesterol, [low-density lipoprotein](#)

[cholesterol](#), high-density lipoprotein cholesterol, non-high-density lipoprotein cholesterol and triglycerides in a total of 11,418 individuals who were observed during health examinations between 1970 and 2006 at the Cooper Clinic, Dallas, TX. Cardiorespiratory fitness was measured using a treadmill test. After cardiorespiratory fitness levels were standardized for age, subjects were placed into low, middle and high fitness categories, and cholesterol and triglycerides were analyzed after an overnight fast.

Researchers found that total cholesterol, LDL cholesterol and triglycerides all increased up to a certain age and then decreased while the inverse was true for HDL, known as "good" cholesterol. Men with lower cardiorespiratory fitness had a higher risk of developing [high cholesterol](#) in their early 30s while men with high fitness did not see this development until their mid-40s. Additionally, men with low cardiorespiratory fitness reached abnormal HDL and non-HDL [cholesterol levels](#) around their early 20s and mid-30s, respectively, while those with higher fitness saw normal amounts for the entire lifespan.

"These findings suggest that improving cardiorespiratory fitness levels may delay the onset of dyslipidemia," said Yong-Moon Mark Park, M.D., the lead author of the study. "Promoting this healthy lifestyle factor may also help to reduce the risk of atherosclerosis and cardiovascular disease."

In a corresponding editorial, Paolo Boffetta, M.D., professor of medicine at the Institute of Translation Epidemiology at the Icahn School of Medicine at Mount Sinai, also stressed the importance of promoting [cardiorespiratory fitness](#). "The prevalence of physical inactivity in the United States continues to rise, especially in younger age groups," he said. "It is important to now direct efforts towards translating these findings to clinical and preventative practice. Greater emphasis needs to be made on educating the public on the importance of exercise

and clinicians should help counsel patients on [fitness](#) regimens."

Provided by American College of Cardiology

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