

High cholesterol caused by childhood sedentariness could be reversed with light physical activity

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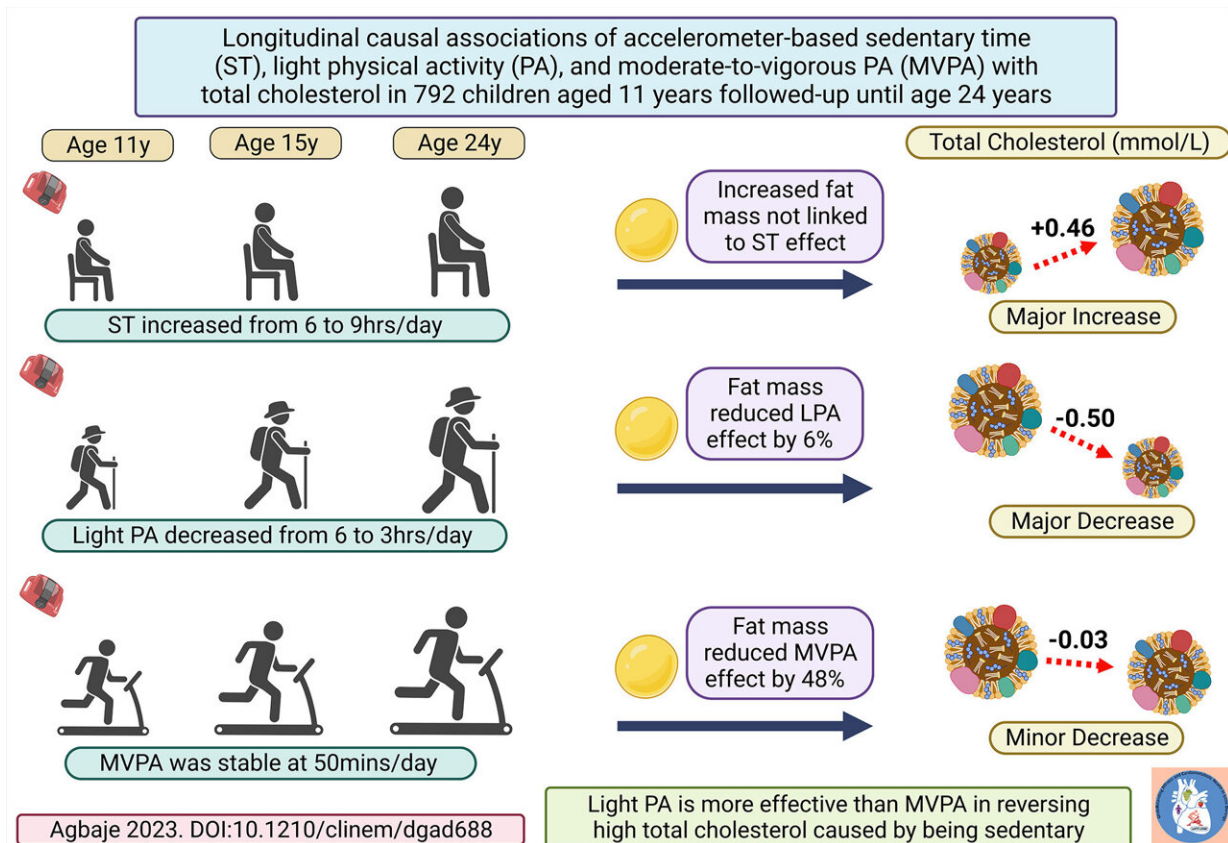
Increased sedentary time in childhood can raise cholesterol levels by two thirds as an adult, leading to heart problems and even premature death—but a new study has found light physical activity may completely reverse the risks and is far more effective than moderate-to-vigorous physical activity.

The study was conducted in collaboration between the University of Exeter, University of Eastern Finland, and University of Bristol. The paper, titled "[Associations of Sedentary Time and Physical Activity from Childhood with Lipids: A 13-Year Mediation and Temporal Study](#)", is published in the *Journal of Clinical Endocrinology & Metabolism*.

Researchers used data from the University of Bristol study Children of the 90s (also known as the Avon Longitudinal Study of Parents and Children), which included 792 children aged 11 years who were followed up until the age of 24.

Results from this study found that accumulated sedentary time from [childhood](#) can increase [cholesterol levels](#) by two-thirds (67%) by the time someone reaches their mid-twenties. Elevated [cholesterol](#) and dyslipidemia from childhood and adolescence have been associated with [premature death](#) in the mid-forties and [heart problems](#) such as subclinical atherosclerosis and cardiac damage in the mid-twenties.

Healthy lifestyles are considered important in the prevention of dyslipidemia and one of the primary ways of lowering cholesterol, apart from diet, is movement behavior. For the first time, this study objectively examined the long-term effects of sedentary time, light physical activity, and moderate-to-vigorous physical activity on childhood cholesterol levels.



Increased sedentary time from childhood through young adulthood may potentially cause elevated cholesterol and dyslipidaemia in adolescence and young adulthood, however, light physical activity can significantly reverse worsening dyslipidaemia. The increase in fat mass from childhood remarkably dampened the effect of moderate-to-vigorous physical activity on lowering cholesterol. Credit: Andrew Agbaje.

The World Health Organization currently recommends children and adolescents should accumulate on average 60 minutes of moderate-to-vigorous physical activity a day and reduce sedentary time but have limited guidelines for light physical activity. Yet this new study and other recent studies have found light physical activity—which includes exercises such as long walks, house chores, or slow dancing, swimming, or cycling—is up to five times more effective than moderate-to-vigorous

physical activity at promoting healthy hearts and lowering inflammation in the young population.

Dr. Andrew Agbaje from the University of Exeter led the study and said, "These findings emphasize the incredible health importance of light physical activity and shows it could be the key to preventing elevated cholesterol and dyslipidemia from early life."

"We have evidence that light physical activity is considerably more effective than moderate-to-vigorous physical activity in this regard, and therefore it's perhaps time the World Health Organization updated their guidelines on childhood exercise—and public health experts, pediatricians, and health policymakers encouraged more participation in light physical activity from childhood."

During the research, accelerometer measures of sedentary time, light physical activity, and moderate-to-vigorous physical activity were collected at ages 11, 15, and 24 years. High-density lipoprotein cholesterol, low-density lipoprotein cholesterol, triglyceride, and total cholesterol were repeatedly measured at ages 15, 17, and 24 years.

These children also had repeated measurement of dual-energy X-ray absorptiometry assessment of total body [fat mass](#) and [muscle mass](#), as well as fasting [blood glucose](#), insulin, and high sensitivity C-reactive protein, with smoking status, socio-economic status, and family history of cardiovascular disease.

During the 13-year follow-up, sedentary time increased from approximately six hours a day to nine hours a day. Light physical activity decreased from six hours a day to three hours a day while moderate-to-vigorous physical activity was relatively stable at around 50 minutes a day from childhood until young adulthood. The average increase in total cholesterol was 0.69 mmol/l. It was observed without any influence from

body fat.

An average of four-and-a-half hours a day of light physical activity from childhood through young adulthood causally decreased total cholesterol by (-0.53 mmol/l), however, body fat mass could reduce the effect of light physical activity on total cholesterol by up to 6%.

Approximately 50 minutes a day of moderate-to-vigorous physical activity from childhood was also associated with slightly reduced total cholesterol (-0.05 mmol/L), but total body fat mass decreased the effect of moderate-to-vigorous physical activity on total cholesterol by up to 48%. Importantly, the increase in fat mass neutralized the small effect of moderate-to-vigorous physical activity on total cholesterol.

These findings come shortly after [another study](#) led by Dr. Andrew Agbaje published in *Nature Communications* found light physical activity may completely reverse childhood obesity linked to increased sedentary time in more than 6,000 children.

Sedentary time contributed 7-10% of the total fat mass gained during growth from childhood until young adulthood. Light physical activity decreased the overall gain in fat mass by 9.5–15%, while moderate-to-vigorous physical activity decreased fat mass by 0.7–1.7%.

Dr. Andrew Agbaje of the University of Exeter said, "Our research suggests light physical activity may be an unsung hero and it is about time the world replaced the mantra of 'an average of 60 minutes a day of moderate-to-vigorous physical activity' with 'at least three hours a day of light physical activity'. Light [physical activity](#) appears to be the antidote to the catastrophic effect of [sedentary time](#) in the young population."

More information: Andrew O. Agbaje, Associations of Sedentary Time and Physical Activity from Childhood with Lipids: A 13-Year

Mediation and Temporal Study, *Journal of Clinical Endocrinology & Metabolism* (2023). [DOI: 10.1210/clinem/dgad688](https://doi.org/10.1210/clinem/dgad688)

Provided by University of Exeter

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