

# **New study finds lowest risk of death was among adults who exercised 150-600 minutes/week**

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An analysis of more than 100,000 participants over a 30-year follow-up period found that adults who perform two to four times the currently

recommended amount of moderate or vigorous physical activity per week have a significantly reduced risk of mortality, according to new research published today in the American Heart Association's journal *Circulation*. The reduction was 21-23% for people who engaged in two to four times the recommended amount of vigorous physical activity, and 26-31% for people who engaged in two to four times the recommended amount of moderate physical activity each week.

It is well documented that [regular physical activity](#) is associated with reduced risk of cardiovascular disease and [premature death](#). In 2018, the United States Department of Health and Human Services' [Physical Activity Guidelines for Americans](#) recommended that adults engage in at least 150-300 minutes/week of moderate [physical activity](#) or 75-150 minutes/week of vigorous physical activity, or an equivalent combination of both intensities. The American Heart Association's current [recommendations](#), which are based on HHS's Physical Activity Guidelines, are for at least 150 minutes per week of moderate-intensity aerobic exercise or 75 minutes per week of vigorous aerobic exercise, or a combination of both.

"The potential impact of physical activity on health is great, yet it remains unclear whether engaging in high levels of prolonged, vigorous or moderate intensity physical activity above the recommended levels provides any additional benefits or [harmful effects](#) on cardiovascular health," said Dong Hoon Lee, Sc.D., M.S., a research associate in the department of nutrition at the Harvard T.H. Chan School of Public Health in Boston. "Our study leveraged repeated measures of self-reported physical activity over decades to examine the association between long-term physical activity during middle and late adulthood and mortality."

Researchers analyzed mortality data and medical records for more than 100,000 adults gathered from two large prospective studies: the all-

female Nurses' Health Study and the all-male Health Professionals Follow-up Study from 1988-2018. Participants whose data were examined were 63% female, and more than 96% were white adults. They had an average age of 66 years and an average body mass index (BMI) of 26 kg/m<sup>2</sup> over the 30-year follow-up period.

Participants self-reported their leisure-time physical activity by completing a validated questionnaire for either the Nurses' Health Study or Health Professionals Follow-Up Study every two years. The publicly available questionnaires, which were updated and expanded every two years, included questions about health information, physician-diagnosed illnesses, family medical histories and personal habits such as cigarette and alcohol consumption and frequency of exercise. Exercise data was reported as the average time spent per week on various physical activities over the past year. Moderate activity was defined as walking, lower-intensity exercise, weightlifting and calisthenics. Vigorous activity included jogging, running, swimming, bicycling and other aerobic exercises.

The analysis found that adults who performed double the currently recommended range of either moderate or vigorous physical activity each week had the lowest long-term risk of mortality.

The analysis also found:

- Participants who met the guidelines for vigorous physical activity had an observed 31% lower risk of CVD mortality and 15% lower risk of non-CVD mortality, for an overall 19% lower risk of death from all causes.
- Participants who met the guidelines for moderate physical activity had an observed 22-25% lower risk of CVD mortality and 19-20% lower risk of non-CVD mortality, for an overall 20-21% lower risk of death from all causes.

- Participants who performed two to four times above the recommended amount of long-term vigorous physical activity (150-300 min/week) had an observed 27-33% lower risk of CVD mortality and 19% non-CVD mortality, for an overall 21-23% lower risk of death from all causes.
- Participants who performed two to four times above the recommended amount of moderate physical activity (300-600 min/week) had an observed 28-38% lower risk of CVD mortality and 25-27% non-CVD mortality, for an overall 26-31% lower risk of mortality from all causes.

In addition, no harmful cardiovascular health effects were found among the adults who reported engaging in more than four times the recommended minimum activity levels. Previous studies have found evidence that long-term, high-intensity, endurance exercise, such as marathons, triathlons and long-distance bicycle races, may increase the risk of adverse cardiovascular events, including myocardial fibrosis, coronary artery calcification, atrial fibrillation and sudden cardiac death.

"This finding may reduce the concerns around the potential harmful effect of engaging in high levels of physical activity observed in several previous studies," Lee noted.

However, engaging in long-term, high intensity physical activity ( $\geq 300$  minutes/week) or moderate intensity physical activity ( $\geq 600$  minutes/week) at levels more than four times the recommended weekly minimum did not provide any additional reduction in risk of death.

"Our study provides evidence to guide individuals to choose the right amount and intensity of physical activity over their lifetime to maintain their overall [health](#)," Lee said. "Our findings support the current national [physical activity guidelines](#) and further suggest that the maximum benefits may be achieved by performing medium to high levels of either

moderate or vigorous activity or a combination."

He also noted that people who perform less than 75 minutes of vigorous activity or less than 150 minutes of moderate activity per week may have greater benefits on mortality reduction by consistently performing approximately 75-150 minutes of vigorous activity or 150-300 minutes of moderate exercise per week, or an equivalent combination of both, over the long term.

"We have known for a long time that moderate and intense levels of physical exercise can reduce a person's risk of both atherosclerotic cardiovascular disease and mortality," said Donna K. Arnett, M.S.P.H., Ph.D., B.S.N., a past president of the American Heart Association (2012-2013) and the dean and a professor in the department of epidemiology at the University of Kentucky College of Public Health in Lexington, Kentucky. Arnett served as co-chair of the writing committee for the American Heart Association's 2019 [Guideline on the Primary Prevention of Cardiovascular Disease](#), however, she was not involved in the study. "We have also seen that getting more than 300 minutes of moderate-intensity aerobic physical activity or more than 150 minutes of vigorous-intensity aerobic physical exercise each week may reduce a person's risk of atherosclerotic cardiovascular disease even further, so it makes sense that getting those extra minutes of [exercise](#) may also decrease [mortality](#)."

**More information:** Long-term leisure-time physical activity intensity and all-cause and cause-specific mortality: A prospective cohort of US adults, *Circulation* (2022). [DOI: 10.1161/CIRCULATIONAHA.121.058162](#)

Provided by American Heart Association

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