

Six years of exercise—or lack of it—may be enough to change heart failure risk

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Human heart. Credit: copyright American Heart Association

By analyzing reported physical activity levels over time in more than 11,000 American adults, Johns Hopkins Medicine researchers conclude that increasing physical activity to recommended levels over as few as six years in middle age is associated with a significantly decreased risk

of heart failure, a condition that affects an estimated 5 million to 6 million Americans.

The same analysis found that as little as six years without [physical activity](#) in [middle age](#) was linked to an increased [risk](#) of the disorder.

Unlike heart attack, in which heart muscle dies, [heart failure](#) is marked by a long-term, chronic inability of the heart to pump enough blood, or pump it hard enough, to bring needed oxygen to the body. The leading cause of hospitalizations in those over 65, the disorder's risk factors include [high blood pressure](#), high cholesterol, diabetes, smoking and a family history.

"In everyday terms our findings suggest that consistently participating in the recommended 150 minutes of moderate to vigorous activity each week, such as brisk walking or biking, in middle age may be enough to reduce your heart failure risk by 31 percent," says Chiadi Ndumele, M.D., M.H.S., the Robert E. Meyerhoff Assistant Professor of Medicine at the Johns Hopkins University School of Medicine, and the senior author of a report on the study. "Additionally, going from no [exercise](#) to recommended [activity levels](#) over six years in middle age may reduce heart failure risk by 23 percent."

The researchers caution that their study, described in the May 15 edition of the journal *Circulation*, was observational, meaning the results can't and don't show a direct cause-and-effect link between exercise and heart failure. But they say the trends observed in data gathered on middle-aged adults suggest that it may never be too late to reduce the risk of heart failure with moderate exercise.

"The population of people with heart failure is growing because people are living longer and surviving heart attacks and other forms of heart disease," says Roberta Florido, M.D., cardiology fellow at the Johns

Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease. "Unlike other [heart disease risk](#) factors like high blood pressure or high cholesterol, we don't have specifically effective drugs to prevent heart failure, so we need to identify and verify effective strategies for prevention and emphasize these to the public." There are drugs used to treat heart failure, such as beta blockers and ACE inhibitors, but they are essentially "secondary" prevention drugs, working to reduce the heart's workload after dysfunction is already there.

Several studies, Florido says, suggest that in general people who are more physically active have lower risks of heart failure than those who are less active, but little was known about the impact of changes in exercise levels over time on heart failure risk.

For example, if you are sedentary most of your life but then start exercising in middle age, does that decrease your risk of heart failure? Or, if you are active much of your life but then stop being active at middle age, will that increase your risk?

To address those questions, the researchers used data already gathered from 11,351 participants in the federally funded, long term Atherosclerosis Risk in Communities (ARIC) study, recruited from 1987 to 1989 in Forsyth County, North Carolina; Jackson, Mississippi; greater Minneapolis, Minnesota; and Washington County, Maryland.

The participants' average age was 60, 57 percent were women and most were either white or African-American.

Participants were monitored annually for an average of 19 years for cardiovascular disease events such as heart attack, stroke and heart failure using telephone interviews, hospital records and death certificates. Over the course of the study there were 1,693 hospitalizations and 57 deaths due to heart failure.

In addition to those measures, at the first and third ARIC study visits (six years apart), each participant filled out a questionnaire, which asked them to evaluate their [physical activity levels](#), which were then categorized as poor, intermediate or "recommended," in alignment with guidelines issued by the American Heart Association.

The "recommended" amount is at least 75 minutes per week of vigorous intensity or at least 150 minutes per week of moderate intensity exercise. One to 74 minutes per week of vigorous intensity or one to 149 minutes per week of moderate exercise per week counted as intermediate level activity. And physical activity qualified as "poor" if there was no exercise at all.

After the third visit, 42 percent of participants (4,733 people) said they performed recommended levels of exercise; 23 percent (2,594 people) said they performed intermediate levels; and 35 percent (4,024 people) said they had poor levels of activity. From the first to the third visit over about six years, 24 percent of participants increased their physical activity, 22 percent decreased it and 54 percent stayed in the same category.

Those with recommended activity levels at both the first and third visits showed the highest associated heart failure risk decrease, at 31 percent compared with those with consistently poor activity levels.

Heart failure risk decreased by about 12 percent in the 2,702 participants who increased their physical activity category from poor to intermediate or recommended, or from intermediate to recommended, compared with those with consistently poor or intermediate activity ratings.

Conversely, heart failure risk increased by 18 percent in the 2,530 participants who reported decreased physical activity from visit one to visit three, compared with those with consistently recommended or

intermediate activity levels.

Next, the researchers determined how much of an increase in exercise, among those initially doing no exercise, was needed to reduce the risk of future heart failure. Exercise was calculated as METs (metabolic equivalents), where one MET is 1 kilocalorie per kilogram per hour. Essentially, sitting watching television is 1 MET, fast walking is 3 METs, jogging is 7 METs and jumping rope is 10 METs. The researchers calculated outcomes in METs times the number of minutes of exercise.

The researchers found that each 750 MET minutes per week increase in exercise over six years reduced heart failure risk by 16 percent. And each 1,000 MET minutes per week increase in exercise was linked to a reduction in [heart](#) failure risk by 21 percent.

According to the American Heart Association, fewer than 50 percent of Americans get recommended activity levels.

More information: Roberta Florido et al. Six-Year Changes in Physical Activity and the Risk of Incident Heart Failure, *Circulation* (2018). [DOI: 10.1161/CIRCULATIONAHA.117.030226](https://doi.org/10.1161/CIRCULATIONAHA.117.030226)

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