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'No pain, no gain' approach improves walking ability with peripheral artery disease

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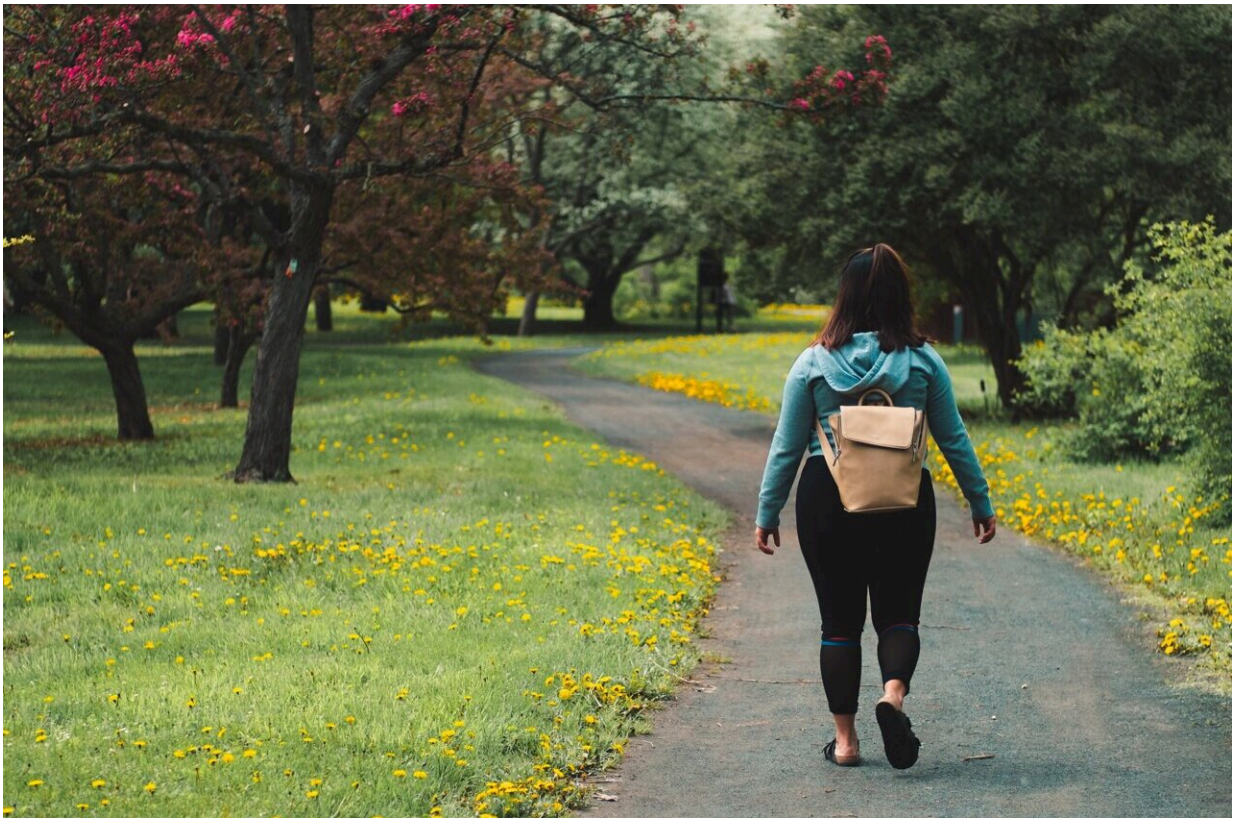

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Walking for exercise at a pace that induced pain or discomfort improved walking ability among people with peripheral artery disease, or PAD, according to new research published today in the *Journal of the*

American Heart Association, an open access, peer-reviewed journal of the American Heart Association.

About 150,000 nontraumatic amputations occur annually, according to the 2021 American Heart Association policy statement: Reducing Nontraumatic Lower-Extremity Amputations by 20% by 2030: Time to Get to Our Feet. Between 8 and 10 million people in the United States have PAD. The condition disproportionately affects Black people, American Indian people and those of low socioeconomic status.

The condition occurs when the arteries that transport blood from the heart throughout the body narrow, reducing blood and oxygen flow. It usually affects the legs and feet causing symptoms while walking, such as cramping, weakness, fatigue, aching and pain or discomfort that subside within 10 minutes of rest. Previous research found that walking for exercise, particularly on a treadmill while supervised by a staff member, improves walking ability and walking distance among people with PAD. What remained unclear were the potential effects of walking at a pace that induced symptoms such as leg pain on speed, strength and balance.

This study examined the effects of home-based walking for exercise among 264 people with PAD who were participating in a randomized clinical trial, called the Low-Intensity Exercise Intervention in PAD (LITE), which included 305 people overall. From September 2015 to December 2019, participants enrolled in the LITE study at four U.S. medical centers (Northwestern University, Tulane University, University of Minnesota and University of Pittsburgh). Their average age was 69 years, 48% were women and 61% were Black adults.

Researchers randomly assigned participants to one of three groups for 12 months. The first group (38%) walked at home at a comfortable pace; the second group (41%) walked at home at a pace that induced leg

symptoms; while the third group (21%) did not walk for exercise. Both walking exercise groups wore an ActiGraph, a device that monitored the intensity of their walking and the time walked.

Personalized thresholds for the ActiGraph intensity that corresponded to walking for exercise at a pace that induced leg symptoms (high intensity) and that corresponded to walking for exercise at a comfortable pace without leg symptoms (low intensity) were defined for each individual randomized to an exercise intervention. Participants randomized to exercise wore their ActiGraph device during walking exercise activity and uploaded data on exercise frequency, intensity and duration to the study website.

At the study's start and at 6 and 12 months, participants completed three tests of leg function: walking speed over a four-meter distance (13 feet) at usual pace, walking speed over a four-meter distance at fastest pace and the short physical performance battery (SPPB) consisting of four-meter walking velocity at usual pace, a standing balance test and the time for five repeated chair rises.

The key findings were:

- At six months, participants whose walking pace induced leg pain or discomfort walked 11 feet per minute faster, and at 12 months, they walked more than 16 feet per minute faster than participants whose walking pace did not induce leg pain or discomfort. Compared to non-exercisers, participants in the group that walked for exercise at a pace inducing leg pain or discomfort walked nearly 13 feet per minute faster at six months, however, this increase was not statistically significant at 12 months.
- At 12 months, people who walked for exercise with leg pain or discomfort scored almost 1 point higher on the sum of the three

> leg function tests (the short physical performance battery), out of a total of 13 points (0-12), compared to people who walked at a comfortable pace with no leg pain. For those walking for exercise at a comfortable pace, there was no improvement in walking speed at six months or 12 months compared to non-exercisers.

"We were surprised by the results because walking for exercise at a pace that induces pain in the legs among people with PAD has been thought to be associated with damage to leg muscles," said senior study author Mary M. McDermott, M.D., the Jeremiah Stamler Professor of Medicine in the division of general internal medicine and geriatric medicine and of preventive medicine at Northwestern University's Feinberg School of Medicine in Chicago. "Based on these results, clinicians should advise patients to walk for exercise at a pace that induces leg discomfort, instead of at a comfortable pace without pain."

This underscores the benefits of walking for exercise at a pace that induces leg pain or discomfort. "This finding is consistent with "no pain, no gain" with regard to walking exercise in PAD," McDermott said.

"Exercise that induces leg pain is beneficial, though difficult," McDermott said. "We now are working to identify interventions that can make the higher intensity exercise easier—and still beneficial—for people with PAD."

It is important to note that study participants walked at home, so the results may not apply to walking on a treadmill in the presence of a health professional, which is the standard of care and first line therapy according to clinical practice guidelines. In addition, the outcomes in this report were not pre-specified outcomes for this clinical trial. Therefore, these findings must be confirmed in future research.

In May 2022, the American Heart Association and 24 collaborating organizations launched the PAD National Action Plan, a guide to assist in the prevention of PAD complications, treatment of cardiovascular risk and improvement of quality of life for those living with the disease.

"PAD is a lifelong medical condition, but people with PAD can lead active and long lives," said American Heart Association volunteer expert and PAD National Action Plan writing group member Joshua Beckman, M.D., director of Vascular Medicine Section and professor of medicine Vanderbilt University in Nashville, Tennessee. "If you notice walking is becoming more difficult, keeping up with others is hard, or you have pain when you walk, talk with a doctor and describe when it happens and how it feels."

More information: *Journal of the American Heart Association* (2022). DOI: 10.1161/JAHA.121.025063

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