

Moderate exercise might be more effective at combatting pre-diabetes

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Walking briskly on a regular basis may be more effective than vigorous jogging for improving glucose control in individuals with pre-diabetes, according to research from Duke Health.

The findings, published online July 15 in the journal *Diabetologia*, are the result of a randomized, six-month study of 150 participants, each of whom was designated as having pre-diabetes based on elevated fasting glucose levels.

Study participants were randomized into four groups. The first group followed an intervention modeled after the Diabetes Prevention Program (DPP), considered a gold standard, that aims to achieve a 7 percent body weight reduction over 6 months. The program requires cutting calories, eating a low-fat diet, and exercising. Study participants in this group adopted the diet changes, and performed moderate-intensity exercise equivalent to 7.5 miles of brisk walking in a week.

Other [study participants](#) were randomly assigned to receive exercise only, using different amounts and intensities: low-amount at moderate intensity (equivalent to walking briskly for 7.5 miles per week); high-amount at moderate intensity (equivalent to walking briskly for 11.5 miles per week); and high-amount at vigorous intensity (equivalent to jogging for 11.5 miles per week).

"We know the benefits of lifestyle changes from the DPP, but it is difficult to get patients to do even one behavior, not to mention three,"

said Dr. William Kraus, M.D., the study's lead author and professor of medicine in the Division of Cardiology at Duke University School of Medicine.

"We wanted to know how much of the effect of the DPP could be accomplished with exercise alone," Kraus said. "And which intensity of exercise is better for controlling metabolism in individuals at risk for diabetes."

On average, participants in the DPP group had the greatest benefit, with a 9 percent improvement in oral glucose tolerance—a key measure of how readily the body processes sugar and an indicator used to predict progression to diabetes.

One of the exercise-only groups came in a close second. Participants in the moderate-intensity, 11.5-mile group saw a 7 percent improvement in glucose tolerance on average. The moderate-intensity, 7.5-mile group had a 5 percent improvement on average.

The lowest improvement was seen among those in the vigorous-intensity, 11.5-mile group, with only a 2 percent average improvement.

"Another way to say it is that a high amount of moderate-intensity exercise alone provided nearly the same benefit on [glucose tolerance](#) that we see in the gold standard of fat and calorie restriction along with exercise," said Cris Slentz, Ph.D., a study co-author and assistant professor of medicine in the Division of Cardiology at Duke.

Kraus and Slentz said the study's results could reflect the different ways in which high- and moderate-intensity exercise impact the body.

"High-intensity exercise tends to burn glucose more than fat, while moderate-intensity exercise tends to burn fat more than glucose," Kraus

said. "We believe that one benefit of moderate-intensity exercise is that it burns off fat in the muscles, which relieves the block of glucose uptake by the muscles. That's important because muscle is the major place to store [glucose](#) after a meal," Kraus said.

The authors note that only a diabetes outcome study could determine whether moderate-intensity exercise is actually superior to high-intensity exercise at preventing patients with pre-diabetes from progressing to diabetes. Still, Kraus said the study's results could provide manageable alternatives for pre-diabetic patients.

"When faced with the decision of trying to do weight loss, diet, and exercise versus exercise alone, the study indicates you can achieve nearly 80 percent of the effect of doing all three with just a high amount of moderate-intensity exercise," he said. "I was heartened by the fact that I found out that I can give patients one message and they can get nearly the same effect as when required to [exercise](#), diet and lose weight all at the same time."

Provided by Duke University Medical Center

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