

Researchers evaluate resistance training for diabetes prevention

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Brenda Davy associate professor of human nutrition, food and exercise at Virginia Tech, said, "Some of the most exciting scientific advances in years to come will be how to help people improve health behaviors long-term." Credit: Virginia Tech Photo

Systematic, progressive resistance training - also called strength training - is a safe and efficient way for middle-aged and older adults to improve their health. A Virginia Tech led research team that includes experts in behavior, exercise, physiology, and medicine is designing a program to help pre-diabetic adults begin and, most important, maintain resistance training in order to prevent diabetes.

"Much attention has been directed at [aerobic exercise](#) for weight management and health; while resistance training is encouraged to build strength and maintain lean [body mass](#), particularly in older adults," said Richard Winett, the Heilig Meyers professor of psychology in the College of Science and director of the Center for Research in Health Behavior and the clinical science program at Virginia Tech. "However lab-gym based studies have shown that resistance training has other potential benefits for prevention and treatment of heart disease, some cancers, and [diabetes](#), and some people may find this form of exercise more appealing."

"In the case of diabetes, improved muscle function may improve insulin and [glucose metabolism](#)," said Brenda Davy), associate professor of human nutrition, food, and exercise in the College of Agriculture and Life Sciences at Virginia Tech.

"But these positive effects depend upon maintaining resistance training over the long-term," said Winett.

Davy and Winett are principal investigators on a five-year, \$3.2 million National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)-funded behavioral change intervention program to help older adults begin and, most important, maintain resistance training.

"The project is a good example of the potential of interdisciplinary collaboration between researchers from different fields," Winett said.

Davy brings knowledge of health and exercise physiology and Winett brings expertise in behavioral science to the collaboration. "The research I have been involved with for most of my career has been related to food intake, [nutrition](#), weight management, and physical fitness," Davy said. "But despite all we have learned, most people still do not adopt and maintain healthy lifestyles. Some of the most exciting scientific

advances in years to come will be how to help people improve health behaviors long-term."

Winett said, "A lot of programs have helped people initiate health behaviors - stop smoking or start walking, for instance - but they have not been very successful at helping people maintain these behaviors."

National data indicate that only 10 to 15 percent of older adults perform any strengthening exercises. Increasing the prevalence of resistance training to 30 percent is an objective of the U.S. Department of Health and Human Services' Healthy People 2010 initiative (www.healthypeople.gov).

Winett noted that studies show that resistance training can be effectively initiated in well-supervised settings, "but there are very few theory-based studies showing effective maintenance of resistance training in typical, minimally supervised settings such as health clubs."

After development and pilot stages, Davy and Winett will conduct a large randomized trial to see how well theory based approaches can help people 50 to 69 years old who are at risk for diabetes maintain resistance training over the long-term in minimally supervised settings. "The primary outcome measures of efficacy will be indices of pre-diabetes (glucose tolerance and fasting glucose concentration) and strength," said Davy. Additional biological and psychological measures will be part of the study.

The first phase will be at the Virginia Tech Riverside Clinical Research Center, located on the Carilion Clinic campus in Roanoke, Va.

"Riverside is a great set-up for one-on-one training during the initial phase of the project. "Our resistance training program is systematic, safe, and gradually progressive. It's also very time efficient taking only about 30-45 minutes twice per week. People will learn a great way to

resistance train that they then will continue in other settings," said Winett.

Davy said there will be a series of exercises performed with 12 to 15 resistance training machines designed to use a different muscle group, all under the supervision of a trainer to insure proper form. "This will be the kind of program you can get involved in through a YMCA or health club," she said.

As many as 200 people will be part of the study over the five-year period.

Collaborators in the project, which is titled: Maintaining [Resistance Training](#) in Older Prediabetic Adults: Theoretical Approach, are Jyoti Savla, assistant professor of human development in the College of Liberal Arts and Human Sciences and affiliated with the Center for Gerontology at Virginia Tech; Soheir Boshra, geriatric medicine physician with the Carilion Center for Healthy Aging; David Williams, a graduate of Virginia Tech's clinical science program and now at the Brown Medical School program in Public Health; Sheila Winett, president of PC Resources, and consultants from the University of Virginia and the University of Padova in Padova, Italy.

"The collaboration with Carilion shows the potential of the Virginia Tech Carilion School of Medicine and Research Institute," said Winett.

The project's objective is consistent with the NIDDK's Behavioral/Prevention Research Program's focus on strategies for prevention of diabetes and its complications through lifestyle modification and other behavioral interventions.

Source: Virginia Tech ([news](#) : [web](#))

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