

SOUTHWESTERN NEWS

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Prolonged, sustained exercise prevents precursor to heart failure, UT Southwestern researchers report

DALLAS – Sept. 14, 2004 – Prolonged and sustained endurance training prevents stiffening of the heart, a condition associated with the onset of heart failure, according to researchers at UT Southwestern Medical Center at Dallas.

The researchers also report that a sedentary lifestyle, in addition to aging, puts older people at risk for heart failure, the leading cause of hospitalizations for patients over 65 and a condition that affects eight out of every 1,000 people older than 70.

Their findings are available online and will be published in the Sept. 28 print edition of *Circulation*.

“It appears that lifelong exercise training completely prevented the stiffening of the heart muscle that has been thought to be an inevitable consequence of aging. We found that it is aging in addition to being sedentary,” said Dr. Benjamin Levine, professor of internal medicine and senior author of the study.

“If people can train and sustain it, a huge impact will be made on one of the biggest scourges of the elderly, which is heart failure with a normal ejection fraction, also called ‘diastolic heart failure’. The overall health of the population would radically improve if a larger number of people would make exercise a part of their daily life.”

About 40 percent of all hospitalizations for heart failure in patients 65 and older are due to diastolic heart failure, a condition in which the heart appears to pump normally. It appears to occur as a result of stiffening of the heart muscle, causing excess fluid to accumulate in the lungs, feet, ankles and legs.

The researchers measured the function and compliance of the left ventricle (the heart’s main pumping chamber) in the study participants. Twelve healthy but sedentary seniors (all about 70 years old), 12 Masters athletes (average age of 68) and 14 young, sedentary controls, (average age of 29) were tested. Six of the Masters athletes, who participate in events from swimming to track, were nationally ranked competitors and six were regional champions. Sedentary participants had not engaged in regular endurance exercise throughout their life.

The researchers tested whether left ventricular compliance decreased with aging alone, or if

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physical inactivity contributed equally to this process.

“We found that the older, sedentary individuals’ hearts were 50 percent stiffer than the Masters athletes, which we expected,” said Dr. Levine, medical director of the Institute for Exercise and Environmental Medicine, a collaboration between UT Southwestern and Presbyterian Hospital of Dallas. “But what we didn’t expect was that the hearts of these senior athletes were indistinguishable from those of the healthy younger participants.

“That specific finding led us to conclude that a sedentary lifestyle is associated with a decline of ventricular compliance and prolonged, sustained endurance training preserves ventricular compliance and may reduce the high incidence of heart failure in the elderly.”

Dr. Levine and his collaborators have already designed an endurance-training program for several of the elderly, sedentary study participants, which has already yielded dramatic results.

“About two-thirds of the sedentary, elderly participants have trained for a year and there is already improvement in their cardiac compliance. Their hearts are more muscular and more flexible,” Dr. Levine said.

A sedentary lifestyle is detrimental to one’s health, but starting and sticking with an endurance-training program plays a major role in reversing the damage done to the heart, even if that program is initiated later in life, he added. Most of the Masters athletes were not elite athletes when they were younger, Dr. Levine pointed out. In fact, most of them did not start training until they were in their 30s.

“It’s not necessarily starting an exercise program that is important, but sustaining it and making it a part of your daily life,” Dr. Levine said.

Other researchers who contributed to the study included Dr. Armin Arbab-Zadeh, a postdoctoral trainee clinician at UT Southwestern and first author of the study; Dr. Rong Zhang, assistant professor of internal medicine; Dr. Qi Fu, Dean Palmer, Dr. Pilar Ochoa-Torres, all from the Institute for Exercise and Environmental Medicine, along with researchers at the University of Nijmegen in the Netherlands and the Cleveland Clinic Foundation.

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