

SOUTHWESTERN NEWS

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UT SOUTHWESTERN REPEATS 30-YEAR-OLD FITNESS STUDY; FOLLOW-UP TESTS ADAGE: "USE IT OR LOSE IT"

DALLAS — October 10, 1996 — Struggling to stay in step with the treadmill's uphill pace, 50-year-old Leo Luebbehusen was not quite sure how he had ended up here for the second time.

A former semi-professional football player, Luebbehusen and four other young college students participated in a landmark study 30 years ago at Southwestern Medical School. The Southwestern researchers studied the body's cardiovascular response to exercise after bed rest and after training.

Now, scientists at UT Southwestern Medical Center at Dallas are repeating the study with the same volunteers, comparing their results as college students to their results as 50 year olds.

"It's hard to imagine now exactly why I did it in 1966," said Luebbehusen, a Hurst lawyer. "I probably needed the money. This time, I thought it'd be interesting to see how much we'd all changed. I'm probably the most out of shape of the group, but I never considered *not* doing it."

The study update is significant because little research has followed individuals' response to exercise at different times of their lives. Results are expected by next spring.

"It's well-known that there's a decline in cardiovascular fitness with age," said Dr. Darren McGuire, a research fellow in internal medicine and the 1996 study's principal investigator. "Is that because people become more sedentary? Is it because the heart doesn't

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work as well? Or is it an impairment of the muscle's ability to utilize oxygen?"

Dr. Jere Mitchell, an investigator on both studies, said the follow-up research may answer the question definitively.

"How much of this change is due to age, per se, and how much is due to increasing physical inactivity," said Mitchell, director of the Harry S. Moss Heart Center at UT Southwestern. "It will test the popular hypothesis — if you don't use it, you lose it."

The original work, published as a supplement to the journal *Circulation*, has been widely recognized as the seminal work on the effects of physical inactivity (bed rest) and of increased physical activity (endurance training).

"The results of the bed-rest portion of that study have had important implications for the treatment of the acute phase of a myocardial infarction in patients and for the understanding of the effect of microgravity in astronauts," said Mitchell. "The results of the endurance-training portion gave a physiological foundation for the now-important clinical use of cardiac rehabilitation."

In the 1966 study, five male college students — three who were sedentary and two who were physically active — were confined to bed for three weeks. Bedridden subjects lose bone, minerals and cardiovascular fitness in a way similar to the deconditioning astronauts experience in space.

"At the time, scientists were talking about manned space flight but no one knew how much conditioning the astronauts would lose," said 1966 and 1996 volunteer Gregg Hill, a Houston-area computer instructor. "There had been several space orbits, but no one had been up for a long time at that point."

The volunteers were put through strenuous training, including treadmill workouts and long-distance running, for eight weeks following the bed rest.

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At the end of the training period, the two previously fit subjects were able to attain the same levels of cardiovascular fitness they had reached prior to bed rest; however, the three previously sedentary subjects reached fitness levels after training that were considerably higher than before the study.

The 1996 study, with all five original participants, has been modified slightly from its predecessor. Current diagnostic and testing technology will be used, and the bed-rest portion has been eliminated.

"One of the assumptions is that in middle age, the subjects are likely to be very close to their bed-rest state," said McGuire. "We assume they have become relatively sedentary and that their body composition has changed. There are also some health concerns about putting a 50-year-old in bed rest — blood-clotting problems, etc."

The training also will be less intense but will last six months. The five subjects will be given heart-rate monitors, which will relay their exercise measures to a computer.

For volunteer Bill Bowman, the follow-up study allows him to keep his word to his daughter.

"I promised her when she graduated from college that I'd get a physical," said Bowman, 50. "Well, she's a third-year medical student at UT Southwestern now, so I thought I'd better do it."

Repeating their participation in the study are Dr. Gunnar Blomqvist, professor of internal medicine and physiology and director of the National Aeronautics and Space Administration's Specialized Center of Research and Training in Physiology at UT Southwestern; Dr. Bengt Saltin, director of The Copenhagen Muscle Research Centre in Denmark; and Mitchell, holder of the S. Roger and Carolyn P. Horchow Chair in Cardiac Research, in Honor of Jere H. Mitchell, M.D., and the Frank M. Ryburn Jr. Chair in Heart

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Research. He also directs the Pauline and Adolph Weinberger Laboratories for Cardiopulmonary Research.

Other co-investigators on the 1996 study are Dr. Benjamin Levine, assistant professor of internal medicine and director of the Institute for Exercise and Environmental Medicine, a joint venture between UT Southwestern and Presbyterian Hospital of Dallas; Dr. Peter Snell, assistant professor of internal medicine; and Dr. Jon Williamson, assistant professor of physical therapy at Southwestern Allied Health Sciences School.

Other original authors included Dr. Carleton Chapman, who was then chief of cardiology at Southwestern and later became dean of Dartmouth Medical School. The young postdoctoral research fellow on the 1966 project, Dr. Kern Wildenthal, is now president of UT Southwestern.

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