News
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******UT Southwestern exercise expert speaks at AHA science writers forum.

DALLAS--This time of year many of us are intent on carrying out our New Year's resolution--to start exercising regularly.

But what we often don't consider is that there are different benefits from the different types of exercises. Weightlifting, for example, builds muscle strength but it does little for the heart and circulatory system.

In fact, it has been shown that "isometric" exercises such as weightlifting cause a sudden rise in blood pressure that is dangerous for those with high blood pressure or heart disease, says Dr. Jere Mitchell, professor of internal medicine and physiology at The University of Texas Southwestern Medical School at Dallas. A weightlifter must add "dynamic" exercise--such as running or swimming--to his exercise program in order to have cardiovascular fitness, he says.

Using everything from computers to weightlifting cats, a team of researchers at UT Southwestern is studying the effects of the different types of exercise. Dr. Mitchell, chief of the school's Weinberger Laboratory for Cardiopulmonary Research and director of its Harry S. Moss Heart Center, has been in the field for more that 20 years and is a widely recognized expert in exercise physiology. He spoke this week at the annual American Heart Association science writers' forum (January 16-18) in Newport Beach, California.

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There are two basic types of muscular activity, he said. Isometric or static muscle activity involves tightening of a muscle but little or no change in muscle length or joint movement, while dynamic muscle activity involves both changes in muscle length and movement of the limbs. "Most forms of exercise are a mixture of both types," he continued, "but lifting weights, pushing against a fixed object like a stuck window, and water skiing are primarily static or isometric exercises, while running, swimming, bicycling and rowing are predominantly dynamic exercises."

He explained further: "Consider, for example, the contrast between water skiing (a predominantly static exercise) and rowing (a predominantly dynamic exercise). Although both involve muscle activity in the arms, shoulders, back and legs, in water skiing the body remains in a relatively fixed position while there is a lot of body movement during rowing."

Dr. Mitchell and his colleagues at UT Southwestern are studying the effects of static and dynamic exercise on the cardiovascular system.

"The distinction between dynamic and static exercise is important because the response of the heart and circulatory system to these two types of activity is very different," he said. "Dynamic exercise increases your ability to deliver oxygen to the tissues. It actually improves the functioning of your heart and circulatory system.

"But static exercise doesn't seem to have that effect at all. If you test the cardiovascular system of a man who has done nothing but weightlifting, he won't have the ability to increase his cardiac output like someone who has been swimming or jogging."

Although the heart's reaction to dynamic exercise has been studied extensively in man and experimental animals, it was only recently that researchers turned their attention to static exercise. Dr. Mitchell and Dr. William Gonyea, associate professor of cell biology at the Dallas health science center, are using cats that have been taught to push and hold a weighted bar for up to 30 seconds. Blood pressure and heart rate are monitored by an electronic device that records any blood pressure change and the amount of blood flow per heartbeat.

"Isometric exercise results in a marked increase in blood pressure but the increase in the amount of blood pumped by the heart is relatively small compared to that seen during dynamic exercise," Dr. Mitchell said. "We are now studying the mechanisms that are responsible for these cardiovascular changes that we see occurring during static exercise."

Because intense isometric exercise causes an acute rise in blood pressure and puts stress on the heart, it should be avoided by people with certain types of heart disease and those with high blood pressure, Dr. Mitchell added. "If the individual's blood pressure is already high, the further acute rise during exercise may be dangerous. There are many stories of people who have died during heavy static exercise, such as changing a tire, shoveling snow or straining to open a stuck window."

For cardiovascular fitness, Dr. Mitchell recommended brisk walking, bicycling, swimming and jogging. He said that anyone starting an exercise program should start out slowly and, if over 35, should see an physician and have an exercise stress test.

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