

Scientists Study Health Benefits of Exercise on Astronauts

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NASA has teamed up with two universities to study ways to reduce the adverse effects of space travel has on astronauts' physical health.

This month scientists are conducting a pilot study at NASA's Ames Research Center, Moffett Field, Calif., on the 20-G centrifuge, a machine that creates artificial gravity forces by spinning and that can simulate up to 20 times the normal forces of gravity we experience on Earth.

"The 20-G Centrifuge is our largest facility certified for use by humans," said Jeff Smith, a manager in the Life Sciences Division at Ames. "Its capabilities make it a unique NASA resource and a very versatile research tool that is ideal for developing health-maintenance activities for astronauts."

Research conducted using the 20-G centrifuge helps scientists understand how astronauts cope with long-term exposure to the low gravity of space or other planets and readjust to Earth's gravity, when they return home. Scientists at NASA, the University of Kentucky in Lexington and Vanderbilt University in Nashville, Tenn., will study the effects of exercise and artificial gravity on cardiovascular responses and fluid shifts within the body.

"At Ames Research Center, the existing facilities we use to learn how space affects humans have a long history of productivity that includes work done from Mercury to space station and space shuttle programs,"

said Dr. Yvonne Cagle, NASA astronaut-scientist liaison, and project study scientist. "Researchers and collaborating investigators continue to produce a wealth of knowledge concerning astronaut and civilian health issues," she added.

The research is expected to help determine what combinations of exercise and exposure to increased gravity effectively counters the changes that occur during space travel.

"While in space, astronauts experience heart and blood vessel changes, decreased bone strength, loss of muscle mass, and shifts in fluids within their bodies," said Ames' exercise physiologist and study scientist, Fritz Moore. "This does not immediately harm the astronauts, but it may complicate longer space travel and make the return to Earth difficult."

Scientists will examine the effects of exercise on the test subjects while spinning on the centrifuge. Helping astronauts counter the changes to their bodies also may further the development of health benefits for the general public.

"The knowledge we gain here helps us understand everyday health issues such as high or low blood pressure." Moore said. "The changes that astronauts experience are very similar to those seen in people who are less active or frequently confined to bed rest, such as individuals in our rapidly growing senior population. It is very likely that space medicine and geriatric medicine will interact and help us understand the best ways to arrive home from space, as well as the best ways to grow old."

Additional research is needed to understand the health effects of transitioning between different gravitational environments. This type of research benefits current and future astronauts supporting the Vision for Space Exploration to return to the moon and continue on to Mars.

Source: NASA

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