

# **When you land, can you stand? One-Year Mission video miniseries: Functional performance**

April 8 2015, by Amy Blanchett

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Test Subject Chris Miller maneuvers an obstacle course which is part of the Functional Task Test that evaluates functional performance in the Neuroscience Motion Laboratory at NASA. Credit: NASA

Historically, in competitions you always want to be the last man standing. At NASA, optimal functional performance, such as standing, is taken even more seriously. When astronauts return to Earth from working on the International Space Station in a weightless environment for an extended period, it takes time for their bodies to readjust to an environment with gravity. Even standing upright can be a challenge, but it is crucial for their job performance as NASA looks at longer missions in the future and landing humans on Mars.

Researchers are conducting several Human Research Program investigations as part of NASA's One-Year Mission, including investigations that examine the changes in performance of functional tasks. The goal is to learn more about how the human body responds to a long-term, low-gravity environment. Results of these investigations may also benefit patients on Earth that are recuperating from a long period of bed rest.

When planning for Mars operations and other deep space missions, it is important that astronauts be able to conduct specific tasks when landing on a planet. The Field Test and Functional Task Test examine functional performance when astronauts return to Earth's gravity after months of weightlessness. Standing is one example of the performance elements needed on a mission to Mars, but there are many other systems in the body that influence the ability to complete critical tasks. These investigations will look at neurosensory networks, hand-eye movements,

fluid distribution and cardiovascular and skeletal muscle performance as a complete picture of functional performance.

Researchers hope to develop a recovery timeline for crew members and evaluate methods to help retrain the body's ability to carry out necessary tasks. These methods and tests will mimic potential astronaut activities and their capability to perform them after they trek the six or eight months to Mars.

As NASA stands-up to its next big challenge, studies like these are essential for keeping astronauts in optimal performance.

NASA's Human Research Program enables space exploration beyond low Earth orbit by reducing the risks to human health and performance through a focused program of basic, applied and operational research. This leads to the development and delivery of: [human health](#), [performance](#), and habitability standards; countermeasures and risk mitigation solutions; and advanced habitability and medical support technologies.



Expedition 39 Flight Engineer Rick Mastracchio of NASA is carried in a chair to a medical tent just minutes after he lands. Credit: NASA/Bill Ingalls

Provided by NASA

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