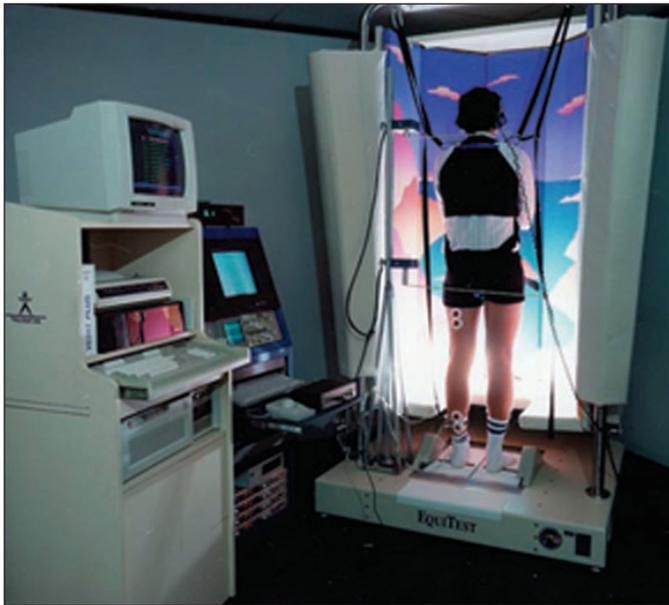


form and a visual surround scene, both of which are motorized to simulate motion. Subjects complete multiple tests before and after the flight to establish stable individual performance levels and the time required to recover them. Two balance control performance tests will be administered. The first test will examine the subject's responses to sudden, balance-threatening movements of the platform. Computer-controlled platform motors will produce sequences of rotations (toes-up and toes-down) and translations (backward and forward) to perturb the subject's balance. The second test will examine the subject's ability to stay upright when visual and/or ankle muscle/joint information is modified mechanically.



A specially modified, computerized dynamic posturography system measures how balance control is changed after astronauts return to Earth from space flight.

These NASA studies of postflight balance disorders are aimed at characterizing and eventually minimizing the safety and health risks to astronauts during and after space flight. Information obtained from this investigation is being used to design techniques for restoring lost movement and balance control capabilities in astronauts.

A relatively large number of individuals on Earth suffer from prolonged, frequently life-long, clinical balance disorders. Disorders like Meniere's disease and traumatic injuries to the inner ear can severely influence quality of life. Currently, human space

flight is the only means available for studying the response to sustained loss and recovery of inner ear information. The National Institute of Health's National Institute of Deafness and Communication Disorders (NIDCD) is using the recovery information from this study to better understand the recovery process of inner ear patients and to improve rehabilitation treatments on Earth.

Falls are the leading cause of injury-related deaths in the elderly and these numbers continue to grow. By the year 2000, falls are estimated to result in 300,000 hip fractures in the United States. This investigation is of particular interest to the NIA because inner ear disorders are thought to account for 10–50% of falls among senior citizens. Study data from previous astronaut subjects have already been compared with similar data from elderly subjects to demonstrate similarities between these balance disorders. The NIA plans to examine these similarities in greater detail with a ground-based study that parallels the STS-95 study.

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