NASA uses EEG biofeedback / NF for astronaut training

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Purpose

The purpose of this project is to test and validate a countermeasure designed to enhance astronaut health, performance, and safety under environmental conditions that are analogs of long duration space flight. This countermeasure, Autogenic-Feedback Training Exercise (AFTE), is a training method that enables individuals to acquire a skill in regulating multiple physiological responses in 6 hours. Previous research has shown that AFTE is an effective treatment for motion sickness, can be used to train control of blood pressure increases, and has a beneficial effect on pilot performance under emergency flying conditions. A second procedure call Neurofeedback Training (NFT) will be used to teach some of you how to directly control brain activity. NFT will be used to help subjects to voluntarily maintain alertness. During future long-term spaceflight aboard the International Space Station or on Mars missions, the probability exists that a crewmember may be compelled to continue work despite a lack of sleep or heavy workloads under certain conditions, (e.g., life-threatening situations, or the potential loss of significant mission objectives). Unlike pharmacological stimulants, which produce harmful side effects, there are no side effects with AFTE. Extended use of such medications may also be contraindicated, as they can be potentially hazardous to crew health. Your participation in this study will allow NASA to answer crucial questions about the usefulness of this training, and will allow us to examine the underlying physiological mechanisms of the AFTE treatment. The present study will first determine if AFTE can improve human performance under conditions of 36-hour sleep deprivation. A second group of NASA and military pilots will determine if this training can also be used to enhance their flying performance in helicopter simulators while using night vision goggles (NVG).