

DeRoshia, C.W. and J.E. Greenleaf. Performance and mood-state parameters during 30-day 6<sup>0</sup> head-down bed rest with exercise training. Aviat. Space Environ. Med. 64: 522-527, 1993.

The study was designed to determine if performance and mood impairments occur in long duration weightlessness simulated by bed rest (BR), and if different exercise-training regimens modify or prevent them. Eighteen normal, healthy men were divided into three similar groups: no exercise, isotonic exercise, and isokinetic exercise. A 15-min battery (Automated Portable Testing System, Essex Corp.) of 10 cognitive performance tests and 8 mood and 2 sleep scales were administered daily during ambulatory control, 30 d of absolute BR, and 4 d of ambulatory recovery. Performance test proficiency increased ( $P < 0.05$ ) for all three groups during BR in 7 of 10 tests and there were no consistent significant differences between the three exercise groups. We conclude that mood and performance did not deteriorate in response to prolonged BR and were not altered by exercise training.

Previous studies of weightlessness simulated by bed rest, mostly performed in the Soviet Union, reported progressive deterioration, manifested by fatigue and lack of energy, emotional lability, sleep disturbances, neurological changes, and inconsistent performance. In contrast, affective mood and performance actually improved in our study from the onset to the end of bed rest. The unexpectedly high degree of subject adaptability to the conditions in our study was attributed to selection of subjects with optimal characteristics for adaptation to isolation, confinement, and restricted mobility, and to highly favorable environmental habitability factors in our study, relative to the previous studies. These habitability factors included maintenance of a stimulating environment, access to communications with friends and relatives, absence of staff/subject conflicts, and absence of strict immobilization. The importance of this research was in providing evidence that appropriate crew selection procedures and the provision of favorable habitability countermeasures can prevent deterioration in the psychological status and performance of space crews during long-duration space missions.