

Ground-Based Preparatory Activities (11)
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DRY IMMERSION AS A PERSPECTIVE MODEL FOR SIMULATION OF PHYSIOLOGICAL
EFFECTS OF SPACE FLIGHT

Abstract

Dry immersion (DI) is one of the most widely used ground models of microgravity. DI accurately and rapidly reproduces most of physiological effects of short-term space flights. The model simulates such factors of space flight as lack of support, mechanical and axial unloading as well as physical inactivity. The current manuscript gathers the results of physiological studies performed from the time of the model's development. The changes induced by DI of different duration (from few hours to 56 days) in the neuromuscular, sensory-motor, cardiorespiratory, digestive and excretory, and immune systems, as well as in the metabolism and hemodynamics will be presented. DI reproduces practically the full spectrum of changes in the body systems during the exposure to microgravity. The numerous publications from Russian researchers, which until present were mostly inaccessible for scientists from other countries are summarized in the talk. These data demonstrated and validated DI as a ground-based model for simulation of physiological effects of weightlessness. The magnitude and rate of physiological changes during DI makes this method advantageous as compared with other ground-based microgravity models. The actual and potential uses of the model are discussed in the context of fundamental studies and applications for Earth medicine.

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