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EFFECTS OF SPACE ADAPTATION SYNDROME AND STUDY OF BIOPHYSICAL CHANGES IN
ANALOGOUS ASTRONAUTS DURING A SIMULATION MISSION TO MARS: IMPLICATIONS FOR
ASTRONAUT HEALTH ON SPACE MISSIONS.**Abstract**

Space Adaptation Syndrome (SAS) represents a critical challenge in space exploration, affecting both the physiological health and mental well-being of astronauts. During the Aurora Mission at the Astronaut Training Center, Poland, the manifestation of SAS in analogous astronauts was studied, analysing its impact on human adaptation to extreme environments.

With the possibility of manned missions to Mars, it is essential to develop effective countermeasures to minimise the adverse effects of SAE and improve the overall human adaptation in space. This study focuses on the physiological changes observed in the cardiovascular, nervous, musculoskeletal and digestive systems, using key measurements such as blood pressure, heart rate, respiratory rate and oxygen saturation (SpO₂).

Through an experimental and multidisciplinary approach, data from the Aurora Mission and previous astronaut spaceflight records are analysed. The results will identify SAE associates and propose mitigation strategies to optimise astronaut performance and safety on extended missions.

This study could generate innovative protocols for the preparation of astronauts and real space missions, allowing to extend the duration of flights and reduce the physiological risks associated with prolonged exposure to space conditions.