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ISOLATION STANDARD MEASURES: A SET OF VALIDATED AND FEASIBLE MEASUREMENTS ENSURING COMPARABILITY ACROSS ISOLATION AND CONFINEMENT STUDIES

Abstract

Isolation and confinement studies have been essential to the preparation of crewed long-duration space missions, acting as analogues that facilitate the study of psychological and physiological responses to isolation and confinement. They also serve as opportunities for the development, testing, and validation of countermeasures and coping methods to handle the challenges that arise in such scenarios. Due to the small sample sizes in combination with high inter-individual variability, single isolation campaigns are not always sufficient for obtaining statistically significant scientific findings. To address this issue and improve comparability between different studies, the need for standardized measures to be collected in all future isolation and confinement studies was identified. Additionally, these measures should also be shown to be generally valid, reliable, feasible and acceptable in analogue and spaceflight environments. Standard measures in isolation and confinement studies allow for more direct comparisons of results and synthesis of data across isolation and confinement studies as well as provide an important step toward standard measures in spaceflight.

An international expert group with representatives from different space agencies worldwide was brought together to define a core set of standard measures for isolation and confinement studies. This paper provides an overview of the expert group's recommendations for international standard measures for future isolation and confinement studies, along with subsequent updates coordinated by the International Countermeasures Working Group (ICMWG), which was established as a sub-Working Group under the International Life Science Working Group (ISLSWG). Additional experts were consulted by the ICMWG partner agencies as required.

The collection of the described set of isolation standard measures will provide data on the following parameters: sleep, mood, psychological state, psychophysiology, cognitive performance, stress and the immune system, general health and well-being, team measures, nutritional measures, and environmental conditions. For each measure, recommendations were made about duration and frequency of administration, along with specific implementation recommendations in relation to the duration of the isolation study. Parameters that were not included in this report but should be considered as potential future additions to the international standard measures were also outlined. The set of isolation standard measures will be re-assessed every two years at a minimum to ensure they are up to date and reflect the current state-of-the-art.