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Author: Mr. Tom Lobb
Aerospacemedic, United Kingdom, lobb_120@hotmail.com

MEDICINE AND ARCHITECTURE IN SPACE HABITATION (M.A.S.H)

Abstract

We can relate to the tedium astronauts encounter in long term space environments from experiencing the COVID19 pandemic lockdowns. Isolation from normality has demanded an assessment of what environmental aspects are required to maintain our mental and physical fortitude.

An Aerospace Physician and a Space Architect reflect on isolation in terms of needs dictated by a restricted environment to be able to work and live comfortably for a prolonged period. The authors armed with their skillsets from each field of expertise critique our collective experiences. Drawing parallels between the pandemic and long-haul space missions we assess existing architectures/experiments proposed for future space missions. Jointly applying our findings and academic fields permit a formulation of an interior design framework.

The key areas discussed which formulate this framework are;

Routine/Spontaneity: The pandemic has forced us to live a fixed daily pattern for a prolonged period with limited spontaneous flexibility.

Goal: To intertwine the repetitive routine in a space mission with a variety of impulsive activities.

Exercise: A vital aspect for health in an individual in space, both body and mind.

Goal: To allow for a design that utilises enjoyable customised exercise experiences.

Senses: Sensory deprivation to sensory abundance.

Goal: To restimulate the senses that one takes for granted in everyday life on Earth.

Working/Living Environment: Lines are blurred between working, personal hours and environment.

Goal: To merge comfortable living/working conditions for a positive work life balance.

Eating/Sleeping: Staples of survival but a platform for emotional and physical stimuli.

Goal: To unlock the emotive and physical links to food and rest.

Escapism/ Hobbies: The ability to escape perceived restraints.

Goal: To remove one from their immediate environment allowing a personalised moment of departure.

Social Interaction: The importance of human interface and relationships, both immediate and afar.

Goal: Creating an environment that allows the social time and interaction with one's immediate colleagues and indirect family/friends.

Personal Space Adaptation: Individual tropes and emotions defining surroundings.

Goal: To have the ability to manipulate one's personal environment.

Safety: Applying design regulations to a new typology of environment.

Goal: A suggested framework for space interior design for optimal health and the betterment of mission success, safety and enjoyment.

This resulting design framework is applied to create an interior focused virtual reality architectural habitation proposal, balancing optimum mission results with the physical and psychological health for long-haul space missions.