



HUMAN HEALTH AND PERFORMANCE

Exploring Space | Enhancing Life

Optimized Exploration-Class Medical Capabilities

Understanding Medical Capabilities of Humans in Extreme Environments

Our unique exploration medical systems expertise and capabilities complement our space medical standards knowledge to optimize crew health, fitness and well-being, as well as technologies, for integrated testing of medical human-system interfaces and human performance resulting in system concepts and mission operations.

World Renowned Skills and Unique Capabilities

The Johnson Space Center, a world leader in human spaceflight, possesses unique knowledge, skills, and capabilities that can be applied to solving human health and performance challenges here on earth, particularly those related to operating in extreme and harsh environments.

NASA expertise is available in the areas of particle/helio-physics, space radiation science, big data analysis, and information technology. These skills complement NASA's human knowledge for monitoring, assessing, and protection solutions for space radiation exposures. These capabilities coupled with technology development and ground based radiation research enable NASA to provide an integrated solution to radiation exposure analysis and mitigation.



Johnson Space Center

Extreme Environment Medical Capabilities including expertise, skills, and knowledge are available to support development of advanced medical systems and operations for both commercial and military applications to assist in: 1) development of new medical capabilities for commercial crew flights; 2) novel space mission endeavors such as an orbiting commercial platform; 3) terrestrial populations working and living in extreme or austere environments and; 4) ocean vessel and facility operations to optimize human health and performance in dangerous environments.

Human Spaceflight Medical Operations

Provides medical support for human spaceflight missions including medical protocols and contingency plans, crew health standards for extreme environments, new medical devices for spaceflight, and medical training for non-physician astronauts, flight surgeons and flight controllers which could be leveraged by commercial crew, extreme environment operations such as oil & gas exploration, and ocean vessel and facilities operations.

Medical Informatics and Health Care Systems

Uses biomedical informatics for collecting and analyzing complex biological data to increase knowledge base and improve overall management of medical information.

Medical Hardware Development

Builds hardware, software, and systems designed to operate in extreme environments as well as reduced gravity. These technologies are ruggedized to withstand radiation, vibration, and temperature extremes associated with spaceflight.

Biomedical Engineering for Exploration Space Technology

Develops innovative biomedical technologies and countermeasures for spaceflight as well as harsh environments on Earth (i.e. underdeveloped countries, military, isolated areas). Creates a variety of unique, customized test beds and cell/tissue based models within a fully functional tissue culture/tissue engineering laboratory to facilitate proof of concept, prototype development and validation.

Biostatistics

Uses knowledge and experience in analyzing data gathered on small numbers of human subjects under non-standard environments and test regimens.

Clinical Risk Modeling

Clinical and bio-statistical expertise is used for modeling medical conditions during spaceflight. From identification of medical conditions of concern in a healthy, medically screened population (in a unique environment) to probabilistic model development, JSC's expertise allows for determination of likelihood of a medical event, probability of evacuation and loss of life, as well as an indirect measure of crew health.

Telemedicine

Practices medicine and maintains crew health for short and long duration missions over significant geographic distances via the application of hardware and software solutions as well as medical operations that effectively extend diagnostic and treatment capabilities of clinicians in remote environments. JSC possesses unique expertise in remote ultrasound guidance of non-physicians, yielding diagnostic-quality imagery.



For the benefit of all