National Aeronautics and Space Administration

HUMAN HEALTH AND PERFORMANCE

Exploring Space | Enhancing Life

Extreme Environment Medical Capabilities

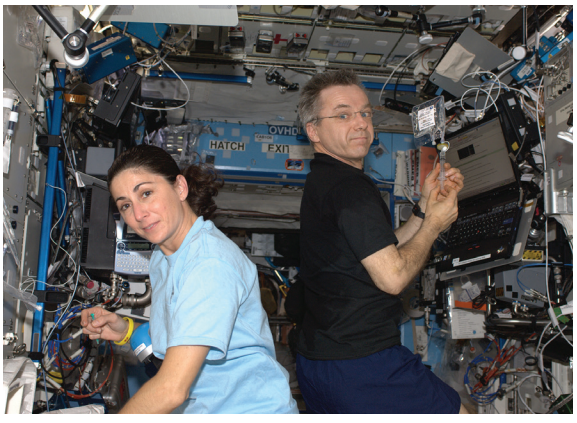
Understanding Medical Capabilities of Humans in Extreme Environments

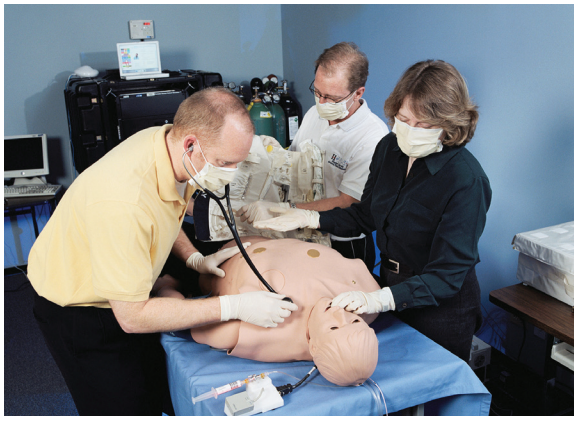
Our unique exploration medical systems expertise and capabilities complements our space medical standards knowledge to optimize the health, fitness and well being of flight crews—as well as technologies—into integrated testing of medical human-system interfaces, human performance into system concepts, and mission operations.

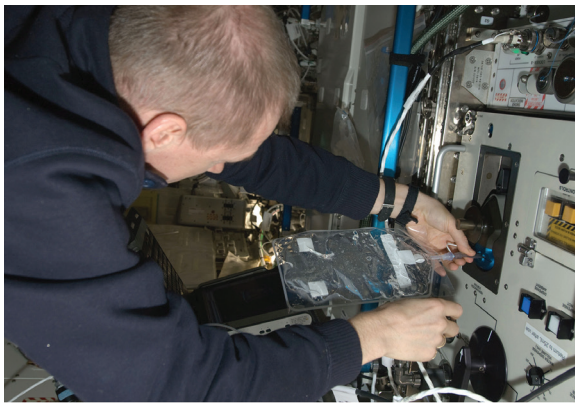
World Renowned Skills and Unique Capabilities

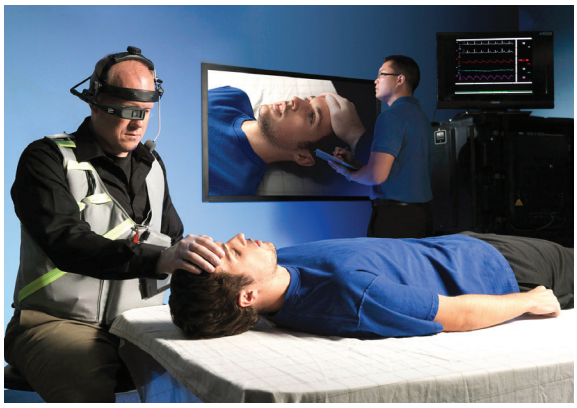
The Johnson Space Center, a world leader in human spaceflight, possesses unique knowledge, skills, and capabilities that can be applied to solving human health and performance challenges here on earth—particularly those related to operating in extreme and harsh environments.

NASA collaboration expertise is available in the areas of space medical systems, monitoring, analysis, and data assessment. This expertise ranges from extreme environment medical research to operational and hardware requirements, medical systems development, design & implementation, verification/validation, crew health monitoring, analysis, and data assessment. Research capabilities include numerous unique space medical laboratory facilities.









Johnson Space Center

The enclosed JSC unique Extreme Environment Medical Capabilities expertise, skills, knowledge and capabilities are available for support of development of advanced medical systems and operations for both commercial and military applications to 1) aid in development of new medical capabilities for commercial crewed flights; 2) aid other, novel space mission endeavors such as an orbiting commercial venture and space tourism; 3) aid terrestrial populations working and living in extreme or austere environments; and 4) aid ocean vessel and facilities operations to optimize human health and performance in extreme environments.

Human Spaceflight Medical Operations

JSC has unique expertise in providing medical support for human spaceflight missions; creating crew health standards for a unique population in an extreme environment; medical contingency planning and support; manifesting new medical devices and protocols; medical training of non-physician astronauts, flight surgeons and other flight controllers which may be leveraged by commercial and space tourism efforts, extreme environment operations such as oil & gas exploration, and ocean vessel and facilities operations.

Medical Informatics and Health Care Systems

Biomedical Informatics is an emerging unique discipline that has been defined as the study, invention, and implementation of structures and algorithms to improve communication, understanding and management of medical information.

Medical Hardware Development

JSC has unique hardware and software development expertise, producing systems designed to operate in extreme environments. These technologies are ruggedized to withstand radiation, vibration, and temperature extremes associated with flight. JSC also possesses unique expertise in developing technologies that can function in reduced gravity environments.

Biomedical Engineering for Exploration Space Technology

JSC has the unique capability of developing advanced biomedical technologies that utilize a wide variety of unique, customized test beds and cell/tissue models within a fully functional tissue culture/tissue engineering lab.

Biostatistics

JSC has unique expertise pertaining to analysis of data gathered on small numbers of human subjects under non-standard environments and test regimens.

Clinical Risk Modeling

JSC has the unique clinical and bio-statistical expertise needed to model the medical conditions of concern in space flight. From identification of the medical conditions of concern in a healthy, medically screened population in a unique environment to probabilistic model development, JSCs expertise allows for determination of likelihood of a medical event, probability of evacuation and loss of life, and an indirect measure of crew health.

Telemedicine

JSC has the unique ability to practice medicine and maintain crew health for short and long duration missions over significant geographic distances via the application hardware and software solutions and medical operations that effectively extend the diagnostic and treatment capabilities of clinicians into the remote environment. JSC possesses unique expertise in remote ultrasound guidance of non-physicians, yielding diagnostic-quality imagery.

For the benefit of all

For more information:
NASA Human Health and Performance Center at
http://NHHPC.nasa.gov or go to:
http://www.nasa.gov/centers/johnson/slsd/

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