

International Congress of Medicine in Space and Extreme Environments

**The International Space Station:
A Low-Earth Orbit (LEO) Test Bed for Advancements in Space and Environmental Medicine**

Tara M Ruttley and Julie A Robinson

Ground-based space analog projects such as the NASA Extreme Environment Mission Operations (NEEMO) can be valuable test beds for evaluation of experimental design and hardware feasibility before actually being implemented on orbit. The International Space Station (ISS) is an closed-system laboratory that orbits 240 miles above the Earth, and is the ultimate extreme environment. Its inhabitants spend hours performing research that spans from fluid physics to human physiology, yielding results that have implications for Earth-based improvements in medicine and health, as well as those that will help facilitate the mitigation of risks to the human body associated with exploration-class space missions. ISS health and medical experiments focus on pre-flight and in-flight prevention, in-flight treatment, and postflight recovery of health problems associated with space flight. Such experiments include those on enhanced medical monitoring, bone and muscle loss prevention, cardiovascular health, immunology, radiation and behavior. Lessons learned from ISS experiments may not only be applicable to other extreme environments that face similar capability limitations, but also serve to enhance standards of care for everyday use on Earth.