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SPACE LIFE SCIENCES SYMPOSIUM (A1)
Applications of Space Medicine to Earth-Related Health Issues (3)

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USING TELECONTROLLED HIGH-FIDELITY HUMAN PATIENT SIMULATORS TO EVALUATE AND EDUCATE HEALTHCARE PROVIDERS AND TELEMEDICAL CONSULTANTS DELIVERING ACUTE MEDICAL CARE UNDER EXTREME CONDITIONS.

Abstract

Telemedicine is a fundamental component of health care delivery in space, and attempts have been made to evaluate and validate various protocols in extreme and remote environments that replicate the resource deficient and psychologically demanding conditions of human spaceflight. High-fidelity clinical simulation has been suggested to be an effective means of assessing the performance of healthcare teams and observing interpersonal dynamics in acute medical situations. The logistic and geographical difficulties in providing in-situ simulation technicians and instructors pose a major barrier to capitalizing on this new innovation in medical education. The development of a telecontrolled patient simulator will facilitate the application of this education modality in human spaceflight research.

Current clinical simulation education literature is reviewed and integrated with an analysis of human spaceflight telemedicine protocol to develop a framework for including high-fidelity patient simulation in space medicine education and telemedical team dynamics research. In addition, a system architecture is proposed that enables distributed high-fidelity simulation delivery, observation, and evaluation to remote sites.

Clinical simulation has already begun to be implemented into numerous medical curricula and has enormous potential to add value to remote medicine education and medical team dynamics research for both space and terrestrial applications. As with any new technology, however, traditional challenges facing the introduction of new telemedicine technologies, including mobility, ease of use, and reliability, must be overcome. Initial, small-scale and local implementation will provide invaluable information in the expansion of the simulation technology for full-scale use.