

SPACE LIFE SCIENCES SYMPOSIUM (A1)  
Medical Care for Humans in Space (3)

Author: Ms. Annie Martin  
Ecole Polytechnique de Montreal, Canada, annie.martin@polymtl.ca

Prof. Catherine Beaudry  
Ecole Polytechnique de Montreal, Canada, catherine.beaudry@polymtl.ca

Mr. Patrick Sullivan  
Canadian Space Agency, Canada, pat.sullivan@asc-csa.gc.ca

Dr. Raffi Kuyumjian  
Canadian Space Agency, Canada, raffi.kuyumjian@asc-csa.gc.ca

Dr. Jean-Marc Comtois  
Canadian Space Agency, Canada, jean-marc.comtois@asc-csa.gc.ca

## TELEHEALTH CONCEPT FOR MEDICAL CARE DURING EXPLORATION-CLASS MISSIONS

**Abstract**

Medical care on the International Space Station (ISS) is provided using real-time communication with limited medical data transmission. In the occurrence of an off-nominal medical event, the medical care paradigm employed is 'stabilization and transportation', involving real-time management from ground and immediate return to Earth in the event that the medical contingency could not be resolved in due time in space. In preparation for future missions beyond Low-Earth orbit (LEO), medical concepts of operations are being developed to ensure adequate support for the new mission profiles: increased distance, duration and communication delays, as well as impossibility of emergency returns and limitations in terms of medical equipment availability. The current ISS paradigm of medical care would no longer be adequate due to these new constraints. The Operational Space Medicine group at the Canadian Space Agency (CSA) is looking towards synergies between terrestrial and space medicine concepts for the delivery of medical care to deal with the new challenges of human space exploration as well as to provide benefits to the Canadian population. Remote and rural communities on Earth are, in fact, facing similar problems such as isolation, remoteness to tertiary care centers, resource scarcity, difficult (and expensive) emergency transfers, limited access to physicians and specialists and limited training of medical and nursing staff. There are a number of researchers and organizations, outside the space communities, working in the area of telehealth. They are designing and implementing terrestrial telehealth programs using real-time and store-and-forward techniques to provide isolated populations access to medical care. The cross-fertilization of space-Earth research could provide support for increased spin-off and spin-in effects and stimulate telehealth and space medicine innovations to engage in the new era of human space exploration. This paper will discuss the benefits of space-Earth research projects for the advancement of both terrestrial and space medicine and will use examples of operational space medicine projects conducted at the CSA in areas such as remote training, tele-mentoring and remote control of an ultrasound.