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MEDEVAC DURING FUTURE EXPLORATION CLASS-MISSIONS: ADDRESSING PROSPECTIVE MEDICAL AND LOGISTICAL CHALLENGES

Abstract

As the duration of spaceflight missions increases and the scope of mission activity expands, evacuation for medical reasons (MEDEVAC) becomes an increasingly likely scenario. Increasing numbers of spaceflight participants will result in a more varied range of potential medical presentations, many of which will require transfer for definitive care.

The Artemis missions in particular present specific logistical challenges to medical evacuation. Casualty packaging on the lunar surface must optimise survivability through a complex transit pathway lasting several days.

As missions evolve to being more remote this process may involve increasing durations which may be measured in days, weeks or longer and be subject to a range of environmental forces, vehicle transfers and potential operational obstacles. The encompassed prolonged field care, prehospital and retrieval medicine skill sets will necessitate specific training for care providers.

Resuscitation and critical care management must be initiated and maintained through variable gravitational and electromagnetic fields while transfer to definitive care through a "Gateway" or though a more complex trajectory is completed.

A specific MEDEVAC pathway must be developed that minimises the time taken for this process while countering potentially malign environmental agents. The specialist prehospital skills of appropriate casualty packaging and management en route will be paramount to survivability. Prolonged field care scenarios also require mental resilience and preparation in order to maintain high level care for unconventionally extended durations as a small team or solo provider.

This presentation will explore medical, logistical and related physical challenges facing Exploration Class Mission MEDEVAC. It will examine evacuation vehicle design and access as well as the viability of telemedical and telesurgical transit support. Consideration will be given to countering resource limitations, remote monitoring maintenance and the practical logistics of intervention delivery during transit. Finally, solutions for the maintenance of skillset currency will also be addressed.