

# ASSESSING CREW MEDICAL OFFICER PREPAREDNESS FOR INTERNATIONAL SPACE STATION MISSIONS

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## INTRODUCTION

Astronaut crew medical officers (CMO) undergo additional, specialized training to provide medical support onboard the International Space Station (ISS). CMO training focuses on utilizing resources on-station and optimizing communication with ground-based expertise to manage both common minor conditions as well as emergency/trauma situations. As NASA moves towards future Artemis and exploration class missions, we sought CMO perspectives on past, present, and future CMO training and medical resourcing to help inform mission planners regarding medical risk mitigation considerations. We present an interview-based qualitative assessment of CMO preparedness for the International Space Station with the aim to help iterate future training flows for Low Earth Orbit, Artemis, and exploration-class missions.

## METHODS

A semi-structured interview tool was developed to assess CMO experience and their recommendations for future mission training considerations. Participants were recruited from former or current US astronauts who were designated as CMO and subsequently flew to the International Space Station. 10 former CMOs took part in the study. Interview transcripts were deidentified and evaluated for qualitative thematic analysis by two independent coders with NVivo Software suite (Lumivero, Denver, CO), and emergent themes were compiled.

## RESULTS

Former CMO crew expressed appropriate preparedness for current ISS medical capabilities and requirements. They identified the role of the CMO as serving as a healthcare extender to ground-based flight surgeons for ISS and other LEO missions. Individuals with prior medical experience were preferred though not felt to be necessary for LEO missions. For exploration class missions with limitations in ground communication, a physician-as-CMO and more rigorous training curricula for both the CMO and astronaut crew were desired.

## DISCUSSION

Former NASA astronaut crew were interviewed to retrospectively assess their preparedness as ISS crew medical officers and hypothesize future medical knowledge, skill, and ability needs. Along with medical operations subject matter expert opinion and advanced probabilistic risk assessment modeling, past CMO experience can help inform future CMO training considerations and responsibilities for future Artemis and exploration class missions.