Exploration Medical Capability (ExMC) is an element of NASA's Human Research Program (HRP). ExMC's goal is to address the risk of the "Inability to Adequately Recognize or Treat an Ill or Injured Crewmember." This poster highlights the approach ExMC has taken to address this risk.

The Space Medicine Exploration Medical Condition List (SMEMCL) was created to define the set of medical conditions that are most likely to occur during exploration space flight missions. The list was derived from the International Space Station Medical Checklist, the Shuttle Medical Checklist, in-flight occurrence data from the Lifetime Surveillance of Astronaut Health, and NASA subject matter experts. The list of conditions was further prioritized for eight specific design reference missions with the assistance of the ExMC Advisory Group.

The purpose of the SMEMCL is to serve as an evidence-based foundation for the conditions that could affect a crewmember during flight. This information is used to ensure that the appropriate medical capabilities are available for exploration missions. The SMEMCL uses the following clinical priority scale describing which medical conditions will be given resources for diagnosis and treatment.

- **Shall**: Diagnostic and treatment capability must be provided
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### Background and Purpose

There are approximately eighty conditions on the condition list approved by the NASA's Space Medicine Division.

For each design reference mission, conditions on the list were prioritized by the ExMC Advisory Group, which includes flight surgeons, physician astronauts, engineers, and scientists. The clinical priority of each condition is based on incidence, consequence, and mitigation capability.

The condition list is a "living document." New conditions can be added to the list, and the priority of conditions on the list can be adjusted as screening, diagnosis, or treatment capabilities change.

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### Exploration Medical Capability (ExMC)

The Exploration Medical Capability (ExMC) Element is tasked with reducing the risk of the "Inability to Adequately Recognize or Treat an Ill or Injured Crewmember" during an exploration mission.

To address this risk, the Element must:
- Define requirements for crew health maintenance
- Develop treatment scenarios
- Extrapolate from the scenarios to health management modalities
- Evaluate the feasibility of these modalities
- Develop technology and informatics that will enable the availability of medical care and decision systems

### Approach

To address the broad risk of the inability to adequately recognize or treat an ill or injured crewmember, the Element identified medical conditions of concern for exploration missions.

The conditions were gathered from several sources:
- Space flight medical incidents
- The Shuttle Medical Checklist
- The International Space Station Medical Checklist
- Subject matter expert opinion

### Definitions

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### The Near-Earth Asteroid (NEA) Design Reference Mission

**Mission duration** – 13 months  
(6 months on the outbound journey, 1 month of surface or proximity operations, and 6 months on the return journey)  
**Crew size** – 3 crewmembers (2 male, 1 female)  
**Extravehicular Activities (EVA)**  
No planned EVAs during the transit phase  
Tethered EVAs during the surface/proximity operations

### Additional Information

Human Research Program: [http://humanresearch.jsc.nasa.gov](http://humanresearch.jsc.nasa.gov)  
HRP Roadmap: [http://humanresearchroadmap.nasa.gov](http://humanresearchroadmap.nasa.gov)  
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