WHAT HAS ExMC SYSTEMS ENGINEERING BEEN UP TO SINCE LAST IWS?

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Long duration Lunar and Martian missions will change the way NASA currently practices medicine. The missions will require more autonomous capability compared to current low Earth orbit operations. For the medical system, lack of consumable resupply, evacuation opportunities, and real-time ground support are key drivers toward greater autonomy. Recognition of the limited mission and vehicle resources available to carry out exploration missions motivates the Exploration Medical Capability (ExMC) Element's approach to enabling the necessary autonomy. This element promotes human health and performance in space by advancing medical systems design and risk-informed decision-making for long-duration deep-space exploration missions (LDEMs).

ExMC is using system engineering processes and Model-Based System Engineering (MBSE) tools to identify the user needs and requirements of LDEM medical systems. The MBSE approach to medical system design offers a paradigm shift toward greater integration between the vehicle and the medical system, and directly supports the transition of Earth-reliant International Space Station operations to the Earth-independent operations envisioned for LDEMs. This talk will provide a high-level overview of what the ExMC SE team has accomplished since the last IWS, an introduction to upcoming SE talks, and the ongoing systems engineering work.