

Life on Mars

How Butterfly iQ can support
preparedness for public health
disasters and Martian life.

A Case Study by

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Who Am I?

I am a disaster¹, emergency and extreme medicine physician with experience in low-resource humanitarian settings². Extreme medicine is a subspecialty emergency clinical practice that addresses, investigates and strategizes medical care in ICE (Isolated, Confined, Extreme) environments. In these environments, a common problem such as a bone fracture requires a different approach than it would near a well-staffed and well-resourced hospital. These procedures and protocols are critical in remote environments and during public health crises, where resources are limited. Because both scenarios involve extremely limited resources and dire circumstances, the research and training we do in a Mars analog are directly transferable to procedures that can be used here on Earth.

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...the best way to train for major accidents, mass casualty incidents and disasters is by simulating environments to test the tools that will support medical care.

The applicability for Butterfly iQ to preserve and protect life on Mars provides this critical data for our future on Earth.

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What Am I Doing in a Space Suit?

In February 2020, Crew 220 was the first to conduct a Station-to-Station Mars analog mission at the Mars Desert Research Station (MDRS)³. This mission featured two stations working together for the first time, coordinated by Mars Academy USA (MAU)⁴. Mars analogs are field missions that simulate living conditions similar to the environments on Mars⁵.

As the Medical Crew Officer, it is my responsibility to supervise the health of the crew and provide first aid training. This is a different setting than my work as an emergency physician at Tønsberg Emergency Ward in Norway. It draws on my skills and experience in the emergency room, and applies them in extreme and potentially disastrous environments. It's a professional challenge – and a thrill!



Where Does Butterfly iQ Fit In?

We know that exercises and simulation are the best way to train for major accidents, mass casualty incidents, and disasters. Personally, I also know the value of Point-of-Care Ultrasound (POCUS) and Focused Assessment with Sonography for Trauma (FAST) examinations.

In addition to its use for FAST scans, using the Butterfly iQ's telemedicine feature, the local scanner with the ultrasound probe can call a remote expert, who will have instant access to the ultrasound image in real-time and can guide the examination remotely. The remote expert

can change settings, and save images and video of the examination. They can even coach the scanner without verbal communication by using AR (Augmented Reality). This guidance can be important in noisy environments, or if the communication system fails. We also had the opportunity to test the Butterfly together with The Golden Bubble — a pressurized emergency medevac device. This makes ultrasound applicable in the extreme Martian environment and similarly extreme environments on earth. During the analog simulation, we saw that the ability to make a quick diagnosis enhanced decision-making for evacuation methods and support needed.



Why Should You Care?

The best simulations are based on real-life incidents. But no one has ever stayed long-term on another planet. No one, outside of science fiction, has ever experienced what we, as analog astronauts, are trying to simulate.

All reports illustrating findings from these simulations are available open-source on the MDRS website⁴, so anyone can apply this data to similar investigations on Earth.

Butterfly Network's portable ultrasound devices and TeleGuidance features are invaluable in this setting. Using the iQ and a personal mobile device, a complex radiological tool is now available in your pocket immediately. It is hard to picture an environment where this will be more critical than in an ICE environment.



Resources

1. <https://www.dismaster.com/>
2. <https://maetaoclinic.org/>
3. <https://marsacademyusa.com/>
4. <https://mdrs.marssociety.org/2020/02/03/crew-220-mission-summary/>
5. <https://www.nasa.gov/analogs/what-are-analog-mission>

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