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An evacuation of injured "astronaut" during a training mission in Utah. (Photo by the author)

Commentary

Paramedics in Space! It's Not Rocket Surgery… Or Is It?

By Steve Whitfield, FRGS, FAWM, RP, WEMT | 8.21.20

A scientific research team recently deployed to the Mars Desert Research Station in the deserts of Utah in November 2019. Why was the team noteworthy? That is because the research team deployed with a paramedic as the crew medical officer. Nothing speaks to the quintessence of remote or extreme environment medicine more than space, and Mars exploration represents the most remote and extreme environment that humans have ever contemplated exploring.

Remote and extreme environment medicine is often challenging. It is associated with restricted access to equipment and resources and frequently linked to extended field care. However, the very nature of remote and extreme environment medicine may well place paramedics as the prehospital specialist who can adapt to the limiting nature of remote environment medicine, particularly when employed in conjunction with telehealth augments supported by physicians.

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With this in mind, and in the context of remote or extreme environment medicine delivery, there is a discussion to be had regarding paramedics being involved in remote and extreme medicine, and one that is pointing to the stars.

Limitations in Practice

The limitations of remote and extreme environment medicine are often associated with a lack of available equipment — and indeed require novel approaches and some improvisation. However technological improvements in point-of-care testing devices are enhancing out-of-hospital interventions. This has seen emergency medical services (EMS) and ambulance shift from a protocol-driven industry to an autonomous growing profession that is paramedicine.

Expeditionary medicine, humanitarian medicine, aerospace medicine, offshore medicine, shipboard medicine and space medicine are pushing boundaries of

healthcare in extreme environments. However, the increasing skill sets and clinical knowledge of paramedics, and the collaborative approaches with physician support have seen an increasing number of paramedics working in these realms in new roles. Therefore, the intention of this article is to show how paramedics can work to impact remote and extreme environment medicine and encourage paramedics to reach for the stars so to speak.

Before we get starry eyed, it is vital we all understand the benefit, and often needed requirement of having dual qualifications in remote and extreme healthcare. While a paramedic is useful, a paramedic with an engineering background is much more useful in a remote environment – such as a remote arctic outpost – than a standard paramedic without a background in engineering. A paramedic with human rights knowledge and qualifications is more useful in humanitarian operations than a standard paramedic with no human rights experience. Paramedics need to get out of their comfort zone and dual skill to increase their involvement in remote and extreme environment medicine.

Professionally, I am a paramedic first, but I have been fortunate to be mentored in climbing, diving and geography. My experiences in geography and earth science is what got me my first role on a remote expedition in a medical and logistical role. An opportunity that would not have occurred without dual skills and experience. However, there is one aspect of extreme environment medicine (space medicine) that I never considered an option until recently thanks to a collaborative project with space physicians. (I should have studied engineering).

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To be an astronaut is no small feat. They say for every day an astronaut spends in space, they have equally studied and worked over 40 days in training. And these overachieving minority are also dually qualified scientific masters (of the universe).[1] Space physicians often also possess a background in engineering or other science, so what chance does a paramedic have?[2] Get dual skilled and find out!

Consider This… The Private Space Race

While the contemporary astronaut is a carefully selected, pre-screened, health-managed individual, lets ponder the private space race. Thirty years ago, Mount Everest was only accessible to the highly trained and experienced mountaineering

community. Fast forward a few decades and not only are people contending with traffic jams in the death zone, people with limited experience and serious health concerns are on the mountain. This has dramatically changed the medical presentations on the mountain, thus impacting how medical responses occur. Where once only the elite climber could be found, doctors, nurses and paramedics with climbing experience now litter a network of mountain clinics in these areas for the changing demographic and their associated health concerns.

Back to the space race, Virgin Galactic, Blue Origin, SpaceX and Boeing are some of the private companies competing for a portion of the lucrative private space race. Soon, we will see private citizens in space. Axiom Space is a private United States-based company that anticipates the construction of its own private space station for wealthy space tourists in order to launch its first two modules in 2023.[3] Space tourist! As of 2012, only seven civilians have paid to travel to the International Space Station as space tourists. The current cost omits many from achieving this, however their involvement confirms that such a market exists, and this will develop eventually into affordable spaceflight.

The growing private space industry will guarantee a similar shift in demographic (now found at Mount Everest) in space. As early as 1975, NASA had suggested a wheel shaped space station that could house thousands of space travellers. Space tourism will introduce an entirely new breed of space traveller. As such, the era of the well-prepared astronaut will likely wan. Like Everest and the polar regions, if people can pay to get there, there will be people willing to take them. This will increase the medical issues in space with things not previously seen. Pre-existing cardiac conditions, respiratory complications and decompression illness are just some of the

medical issues that will likely increase in space as access to space grows.

The health care continuum developed on Earth will need some adaptions for space, however the dual-qualified paramedic will be a useful conduit between the incident and the ongoing health care. But only if we take control of our industry and develop the professional dual role aspects of this now.

Currently, if paramedics are to be utilised in extreme environments, they will need to possess more than just a paramedicine qualification. After all, if it is good for doctors and nurses to dual skill, why would paramedics expect different? With the professionalisation of paramedicine internationally, opportunities are already opening, and if our profession is willing to step outside its comfort zone and dual skill, a paramedic in space in the future is tangible. I spent November 2019 on "Mars" as a medical officer, health and safety officer and researcher. Like the myocardium (the muscular tissue of the heart), a crew must work in functional syncytium (a single cell or cytoplasmic mass containing several nuclei) where dual roles are a must.

References

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