

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Medicine in Space and Extreme Environments (4)

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THE AUSTRALIAN ANTARCTIC SPACE ANALOGUE – A MEDICAL MODEL FOR LONG
DURATION SPACEFLIGHT**Abstract**

Australia has conducted expeditions to the Antarctic for more than a century. The Australian Antarctic Division (AAD) has maintained a permanent presence in East Antarctica since 1954, now with three Antarctic research stations (Casey, Davis and Mawson) and one sub-Antarctic research station on Macquarie Island. Each research station is supported by an Antarctic Medical Practitioner who is responsible for the comprehensive medical, surgical, anaesthetic and dental care of their expeditionary team with advanced training and telehealth support provided by the Polar Medicine Unit in Kingston, Tasmania

During the summer months, research stations have populations between 30 and 120 expeditioners and although medical evacuation is technically feasible it is uncommon due to complex logistics, often taking weeks to return an expeditioner to Australia. During the Antarctic winter the populations reduce to 15 to 35 expeditioners who are physically isolated from the outside world for up to nine months during which time medical evacuation is not possible. The isolation experienced by our expeditionary teams, coupled with unique Australian generalist skills in rural and remote medicine, has facilitated the development of an advanced medical model to support expeditioners within the Australian Antarctic Program.

Antarctic Medical Practitioners are selected with a broad range of clinical skills across generalist medicine, surgery, anaesthesia, orthopaedics, emergency medicine, obstetrics, gynaecology, occupational, industrial and environmental health, dentistry, radiology, physiotherapy, and more. They receive comprehensive training in collaboration with the Centre for Antarctic Remote and Maritime Medicine (CARMM), the Australian College of Rural and Remote Medicine (ACRRM), the Tasmanian Health Service and the University of Tasmania. During their deployment they are supported with world-leading telehealth technologies and robust clinical systems.

Future long duration astronaut crews will require new medical models with increased autonomy to mitigate their isolation and confinement. This will require new approaches to crew selection, medical training, resourcing and clinical support which have not been required in low earth orbit.

The proven success of the medical model developed by the AAD's Polar Medicine Unit over seven decades provides an example of high quality medical care that can be provided to crews facing extended

isolation and confinement. This is founded on a generalist medical model, an advanced scope of practice, unique training and advanced telehealth support which translates to terrestrial and space-based settings.

The Australian Antarctic Division is a division of the Australian Government Department of Climate Change, Energy, the Environment and Water coordinating the Australian Antarctic Program.