

Original Research Template:

This type of abstract describes the results and significance of new research undertaken to address gaps in the current knowledge of aerospace medicine or human performance.

Please retain the headings in **BOLD** and replace the *blue text in italics* with your submission.

INTRODUCTION: *<This section includes the background, including a statement of the problem and why it is important, the status of the current research, and the hypothesis to be tested.>*

METHODS: *<This section includes a brief description of how the study was conducted, the number, type, and gender of the subjects, and how they were selected and grouped. It should also include the metrics collected, how they were measured, and how frequently they were recorded. The types of scales or questionnaires administered should be identified. Environmental conditions and administered medications should be described. In addition, a summary of the statistical methods should be provided. A statement concerning ethics approval for studies using human or animal subjects is also required.>*

RESULTS: *<This section includes a summary of the data and metrics of operational and/or statistical significance. "Results will be discussed" is not acceptable.>*

DISCUSSION: *<This section interprets the meaning of the results in terms of their application to the operational/clinical/scientific community and suggests areas for future research.>*

Example (AMHP 86(3):204, 2015):

REACTIVATION OF LATENT VIRUSES UNDER STRESS IN ANTARCTIC PERSONNEL

INTRODUCTION: Antarctica is a unique environment in which personnel must perform their duties under significant physical and psychological stress. Stress can lead to immune suppression and reactivation of latent viruses. Significant stressors are also found in other extreme environments, such as spaceflight.

METHODS: The medical records for U.S. Antarctic personnel living at McMurdo and Palmer Stations during the 2014 winter season were reviewed for occurrence of herpes zoster as a marker of viral reactivation. The number of cases was used to determine the incidence rate, which was compared to the incidence in the general population.

RESULTS: Five cases of zoster reactivation occurred in the U.S. Antarctic Station population, including one case with ocular involvement. Four of the 5 cases were in persons under 40 years of age, in a population of about 182 persons wintering over, for a total population incidence of 27 per 1,000, and about 22 per 1,000, in persons 30 to 39 years of age. The usual incidence of zoster is roughly 4 per 1,000 person years in the U.S. population, and 2 per 1,000 in the 30 to 39 year old age group.

DISCUSSION: The incidence of zoster at McMurdo Station this winter represents over an eight-fold increase in the overall incidence found in the general U.S. population, and an even larger, 11-fold increase in the 30 to 39 year old population. Working and living in an extreme environment can cause significant physiologic and psychological stress that can lead to altered immune function, such as increased expression of inflammatory cytokines and decreased cell mediated immunity. Reduced immune function can lead to reactivation of

latent viruses, increased viral shedding, and symptomatic reactivation leading to clinical syndromes such as zoster. Such changes have been observed in Antarctic personnel, U.S. astronauts, and others. The nature of these immune changes must be well defined to better manage the care of Antarctic personnel and, more critically, before undertaking human exploration of deep space. Antarctica and the International Space Station are natural and reciprocal analogs for this work.