NxPCM Assessment

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Study Title: Efficacy of Vitamin D Supplementation in an Antarctic Ground Analog of Space Flight

Principal Investigators: Scott M. Smith NASA/JSC (PI); James Locke NASA/JSC (Co-I); Sara R Zwart USRA (Co-I)

Research Gaps

- Gap associated with this study
  - N2: What is the optimal dose of vitamin D supplementation?

- Recommended future studies or gap(s):
  - This study provides information, but does not close gap N2.
  - Future studies are already in progress
    - Vitamin D dosing – conducted using Human Test Subject Facility participants to evaluate the safety and efficacy of daily, weekly, and monthly Vitamin D dosing regimens.
    - Polar Vitamin D II – conducted at McMurdo station in Antarctica evaluating daily versus weekly Vitamin D supplementation. Additionally, some immunological tests will be performed as a preliminary study on the influence of the Antarctic environment on the immune system.
    - No additional studies are recommended at this time.
  - NxPCM does not recommend any new gaps based on this data. Evaluations will be made following the completion of the Vitamin D and Polar Vitamin D II studies.

NxPCM Study Summary:

The Polar D study evaluated the effectiveness of 3 Vitamin D dosing regimens (400, 1000, and 2000 IU/day) in a randomized, double-blinded study conducted on subjects during winter in Antarctica. The Antarctica environment served as a good analogue to the space-flight environment due to the low UVB radiation levels. The study found that increasing daily vitamin D intake by supplementation increased Vitamin D levels as was expected, but even the 2000 IU/day supplement did not increase levels to the optimal >75-80 nmol/L. The investigators suggest that further studies are needed to identify the best dosing regimen and potential interactions of the Antarctic environment on other body systems, such as the immune, endocrine, and central nervous systems. A follow-on study, Polar Vitamin D II, will continue to identify the optimal dose as well as provide preliminary data on the influence of the Antarctic environment on the immune system. The investigators also discovered compliance issues that are being evaluated during the Vitamin D dosing study that is currently in progress.