The Nosology of Asthenia: An International Review
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Objective
To build a foundation shared understanding of the concept and nosology of asthenia on which plans for future research and practice could be built.

Background/Motivation
Russian medical personnel believe that space asthenia is a significant risk for long duration missions; however, USA medical staff typically does not utilize or recognize the concept. To facilitate the development of appropriate countermeasures for space asthenia, future research should aim to understand the key symptoms of the space asthenia syndrome, the context and time span in which it develops, potential cultural variations in the recognition, classification or expression of similar core pathology, and other rationale for differences in perceived prevalence.

Methods
A six phase systematic international literature review of asthenia, in which 13 major databases were examined, and six international experts in related space fields were interviewed.

Results
The international literature review and expert consultation found Asthenia to have considerable cultural, regional and specialty diagnostic and treatment variations. Across twenty two definitions, sixty-two different symptom terms were used to define asthenia, neurasthenia, or psychoasthenia. Several of the symptom terms potentially referred to similar or related human experiences (e.g. fatigue and weakness, difficulty concentrating and memory disorder). However, there was not a single symptom term that was consistent with all of the definitions that described asthenia, neurasthenia or psychoasthenia. The six most prevalent symptom terms were difficulty concentrating, fatigue (non-organic related), sleep disturbance, decrease in occupational performance, somatic disease and irritability. The six most prevalent symptom terms used to describe asthenia did not correlate fully with the diagnostic criteria for major depression, dysthymia, general anxiety or chronic fatigue syndrome but there was significant diagnostic overlap, to support these disorders being suggested as differential diagnoses.

Discussion and implications for theory and practice
Research of this nature is made difficult by the complexities, limitations and variations of our nosological classification systems and how they vary over time and place. Many human diseases, particularly in psychological medicine are classified at the nosological syndromal level (groups of symptoms that run together) as we have limited understanding of the underlying pathophysiology or aetiology. Space asthenia has a significant correlation with DSM IV major depression at the symptom term syndromal level and both syndromes may share pathophysiological and aetiological elements. However, there may be significant space context specific pathophysiology and aetiology that requires ongoing research and identification of countermeasures, and warrants the adoption and development of a space asthenia syndrome as an initial model to facilitate this work.

Through the strength of international cooperation a transcultural shared diagnostic definition for space asthenia should be developed, with a related understanding of standardized assessment and treatment methods. This work could have significant implications for practice and research and act as a catalyst or foundation for future broader work that recognizes the importance of a transcultural risk management approach to team development, well being and performance. The International Space Station affords the opportunity for such multiagency, transcultural research. This research would need to consider how space asthenia is related to a range of biopsychosocial factors including sleep and neuroendocrine disturbance, and environmental factors such as: exposure to radiation, interior lighting, isolation, microgravity, changes in levels of CO₂, and/or if it is due to individual or group differences and what role cultural or psychological factors, and epigenesis/gene expression may play.