

# Institute of Aerospace Medicine

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### **Novel exercise and nutritional interventions for preserving vascular health during space flight**

Arterial stiffness is dramatically increased with as little as 6 months spaceflight (Hughson et al. 2016) and this presents challenges to longer-term space flight (i.e. Mars). This presentation will cover a novel nutritional strategy and a novel exercise strategy that have potential for improving vascular health during space flight.

We have recently shown that a pulse-based diet (i.e. chickpeas, beans, lentils, dried peas) can prevent increased blood pressure during bed rest. Pulses are attractive because they are an environmentally-friendly crop (i.e. they require little green-house gas input), they can be grown in challenging environments (i.e. dry, arid conditions), and they have a very low glycemic index and are therefore also beneficial for alleviating insulin resistance, another health concern with spaceflight.

In a small pilot study of older hypertensive individuals we discovered that a stretching exercise program (i.e. designed to increase flexibility) was more effective than an aerobic exercise program (i.e. brisk walking) for reducing blood pressure. Stretching may reduce arterial stiffness (Shinno et al. 2017) and increase parasympathetic nervous system activity (Mueck-Weymann et al. 2004), providing physiological mechanisms by which it may reduce blood pressure.

The presentation will cover the potential benefits of including pulses in the diet of astronauts and the feasibility of a stretching exercise program during space flight.