**The Effects of Lower Body Positive Pressure Treadmill Running on Acute Femoral Cartilage Deformation**

**Presenter: Megan Graff (Sports Medicine)**

**Faculty Mentor: Dr. Nicole Cattano (Sports Medicine)**

Purpose: Examine and compare the acute response of femoral cartilage in healthy individuals after running at full bodyweight (BW) (100%) and 80% BW on a lower body positive pressure treadmill. Methods: Crossover study consisted of 20 total healthy participants (10 males, 10 females). Femoral cartilage width was assessed using ultrasonography before and after the assigned running conditions. The control condition consisted of running at 6mph for 30 minutes at 100% BW, while the experimental condition consisted of running at 6mph for 30 minutes at 80% BW.  Each participant ran both BW conditions, exactly one week apart. The order of conditions was randomly assigned to each participant. All running conditions were completed on the same AlterG Via X treadmill. Results: A significant reduction in cartilage width was found in both the right (p=0.001) and left (p=0.016) knees after running at 100% BW. Baseline cartilage measurements were comparative prior to each running condition and between limbs. There were no significant differences between limbs for either running condition. A significant reduction in cartilage width was seen after running at 80% body weight only in the right lateral compartment (p=0.006). Cartilage showed greater deformation after 100% BW than 80% BW in right (p=0.033) and left (p=0.011) knees. Conclusions: Cartilage thickness change proved to be lower after 80% BW running compared to 100% BW, which could have implications for long term cartilage health and future research into anti-gravity running.