

## 36. SWACSM Abstract

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### The Effects of Short Foot Exercise on Ground Reaction Forces during Landing

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#### ABSTRACT

The foot is a shock absorber which helps attenuate loads during landing activities via pronation. Intrinsic foot muscles help stabilize the arch of the foot and assist in controlling pronation. Excessive pronation during landing may transfer up the kinetic chain, increasing the risk of knee injury. Additionally, increased ground reaction forces (GRF) during landing may increase the risk for an ACL injury. Acute bouts of short foot exercise (SFE) can strengthen IFM, improving foot posture, balance, and energy transfer in dynamic activities, reducing injury risk. **PURPOSE:** Therefore, this study investigates whether SFE training before jump performance lowers GRF upon landing. It is hypothesized that GRF will decrease following SFE. **METHODS:** Ten healthy participants, all right leg dominant, (6 males, 4 females; Age:  $24.9 \pm 1.91$  y; Height:  $1.71 \pm 0.08$  m; Mass:  $66.09 \pm 10.39$  kg), began testing with drop jumps (DJ) from an 18-inch box (PRE), being told to step off the box with hands on their hips, land with feet on the force plate, and immediately jump as high as possible. Two familiarization DJ trials were followed by three test trials with one minute rest between DJ. After initial DJ trials, participants performed 2 sets of 30 repetitions of SFE on each foot while seated, with contractions being held for 5 seconds, and with 2 seconds of rest between repetitions. Two more sets were completed on each foot with the participants standing. Following SFE, participants performed 3 additional DJ (POST). GRF data was sampled at 1000Hz with dual AMTI (Newton, MA) force platforms. Peak GRF during landing was normalized to body mass. **RESULTS:** Paired t-tests indicated no effect of SFE on GRF during landing (PRE= $374 \pm 0.50$  N/kg; POST= $386 \pm 0.54$  N/kg;  $p=0.379$ ;  $d=0.292$ ). **CONCLUSION:** Performing SFE before jumping for a healthy population had no significant impact on GRF during landing. It may be beneficial to investigate SFE effects on GRF in unhealthy or injured populations.