

## **Sled Pull Training Protocol Does Not Improve Peak Force and Increases Asymmetry in Collegiate Soccer Players**

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### **ABSTRACT**

Speed and acceleration are trainable components that are critical determinants of success in team sports, particularly soccer. Lower extremity strength is one of many factors that determine the maximal force output and velocity of individuals, which is critical to success in sport. **PURPOSE:** To determine the effects of a 12-week sled pull training intervention on isometric leg strength and asymmetry. **METHODS:** Participants from Division 1 collegiate men ( $20 \pm 1.5$  yrs,  $168.28 \pm 51.17$  cm,  $73.44 \pm 23.46$  kg) and women's soccer ( $19.58 \pm 1.02$  yrs,  $167.07 \pm 3.81$  cm,  $62.46 \pm 8.41$  kg) team performed pre-training isometric thigh pulls on force plates measuring peak force generation, bilaterally. Participants then performed a 12-week training program consisting of sled pulls performed at 80% of bodyweight, three days a week for 6 weeks followed by a 6-week maintenance phase of sled pulls conducted at 50% of bodyweight and post-intervention testing. **RESULTS:** The pre-training average relative peak force of the left and right legs of male participants were  $14.46 \pm 1.61$  N/kg and  $14.42 \pm 1.33$  N/kg, respectively, and  $11.76 \pm 0.69$  N/kg and  $11.67 \pm 1.08$  N/kg, respectively, of female participants. Sled pull training trended ( $p=0.07$ ) to increase relative peak force in the right leg in both men ( $15.11 \pm 2.14$  N/kg) and women ( $12.27 \pm 1.31$  N/kg). However, training trended ( $p=0.09$ ) to decrease peak left leg force in both men ( $13.60 \pm 2.32$  N/kg), but less so in women ( $11.19 \pm 1.77$  N/kg). This leg specific training effect increased ( $p<0.05$ ) in asymmetry from training in both men (pre:  $-0.74 \pm 13.97\%$ , post:  $8.26 \pm 19.61\%$ ) and women (pre:  $1.48 \pm 12.37\%$ , post:  $9.21 \pm 15.26\%$ ). **CONCLUSION:** Sled pull training increased asymmetry in both men and women. The increased asymmetry could be attributed to a consistent decline in unilateral force production in the left leg in men. However, there was no consistent pattern to explain the increased asymmetry in women.