

## AN EXAMINATION OF RETURN TO PLAY CRITERIA FOR KNEE STRENGTH IN EXPERIENCED SOCCER PLAYERS

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**INTRODUCTION:** Clinicians often use isokinetic strength exercises in the rehabilitation of lower extremity injuries. Isokinetic testing scores are often used as criterion to determine the progression within a rehabilitation protocol as well as the suitability of the patient to return to sport participation. For example, Shelbourne, Klotwyk, and De Carlo (1995) suggested that once the anterior cruciate ligament (ACL) reconstructed extremity achieves 70% of the strength of the uninjured leg, the patient is allowed to engage in sport-specific activities and begin the progression toward competitive participation. A criterion like this would be a valid standard assuming no strength differences exist between limbs. Few bilateral differences in lower extremity strength exist in most sedentary individuals or athletes participating in bilaterally symmetrical lower extremity activities. However, soccer players usually have tendencies to use one leg more than the other for dribbling, shooting and performing long kicks. As a result, soccer can be characterized as an asymmetrical lower extremity activity. If bilateral strength differences exist, then appropriate adjustments should be made for return to activity standards. This study examined whether differences existed in isokinetic knee flexion and extension strength between the dominant and non-dominant legs in experienced soccer players.

**METHODS:** This project is still in progress. A total of 30 (15 males and 15 females) college-aged experienced soccer players will be tested by the end of data collection. Bilateral knee flexion and extension torques will be assessed using a KinCom isokinetic dynamometer (Model AP125, Chattanooga Group Inc.) at speeds of 60 and 180°/s in a seated position. After a warm up, the subject will perform 2 trials of 3 reciprocal extension/flexion repetitions with maximum efforts for each isokinetic speed (3-minute rest period between trials). For each subject, the highest extension and flexion torques for each speed will be used in subsequent analyses. Flexion and extension peak torques will be submitted to a 2 x 2 x 2 (gender x speed x side) MANOVA with repeated measures in the last 2 factors to test for significant differences between males and females, the 2 isokinetic speeds, and the dominant and non-dominant legs ( $\alpha = 0.05$ ).

**RESULTS AND DISCUSSION:** We have performed preliminary analyses on the data we have collected from 5 females (age  $20.0 \pm 0.7$  yrs, height  $164.1 \pm 4.53$  cm, weight  $635.9 \pm 30.7$  N, competitive soccer  $7.2 \pm 3.8$  yrs experience) and 10 males ( $22.1 \pm 2.7$  yrs,  $169.5 \pm 12.0$  cm,  $712.6 \pm 153.6$  N,  $6.3 \pm 3.3$  yrs). For each peak torque, a paired 2-tailed t-test was performed on each peak torque ( $\alpha = 0.05$ ). Peak extension torque at 60 °/s for the dominant leg was significantly greater than the corresponding value for the non-dominant leg. No significant differences were found in the other peak torques. It appears that soccer players possess significantly greater knee extension strength at low contraction speed in the dominant leg. However, this speculation needs to be confirmed using all the data collected for this study.

### REFERENCES:

Shelbourne, K.D., Klotwyk, T.E., & De Carlo, M.S. (1995). Ligamentous injuries. In L.Y. Griffin (ed.), *Rehabilitation of the injured knee* (2nd edition) (pp. 149-163), St. Louis: Mosby Year-Book, Inc.