

## **Gender Differences in Tibial Rotation Proprioception**

Nagai T, Sell TC, Nakagawa T, Abt JP, Fu FH, Lephart SM: Neuromuscular Research Laboratory, Department of Sports Medicine and Nutrition, School of Health and Rehabilitation Sciences, University of Pittsburgh, Pittsburgh, PA

### **Introduction**

Proprioception, such as joint position sense (JPS), threshold to detect passive motion (TTDPM), velocity sense (VS), and force sense (FS) is necessary for maintenance of joint stability. Our previous studies have identified gender-specific deficits in knee flexion/extension proprioception, potentially increasing the risk of ACL injury in female athletes. Currently, no study has examined internal/external tibial rotation proprioception. Therefore, the purpose of this study was to measure and compare internal/external tibial rotation and flexion/extension proprioception between men and women.

### **Methods**

Twenty healthy participants (10 males and 10 females) underwent proprioception testing. JPS was performed by having the subject actively or passively reproduce target positions. TTDPM was performed by having the subject signal when movement direction was appreciated. For FS, subjects exerted 30% of their peak isometric torque for 5 seconds with visual feedback; then, reproduced without visual feedback. For VS, subjects' knee was passively rotated at a specific velocity followed by the subject actively reproducing the velocity.

### **Results**

For the flexion/extension tests, males had significantly decreased ability to perform FS ( $p = 0.01$ ). TTDPM, FS, and VS were not significantly different between genders ( $p > 0.05$ ). For internal/external rotation tests, females had significantly decreased ability to perform TTDPM ( $p = 0.02$ ). JPS, FS, and VS were not significantly different between genders ( $p > 0.05$ ).

### **Discussion and Conclusion**

Gender differences persist in proprioceptive measures indicating that knee injury prevention programs should be tailored to male and female athletes separately.