Objective: Eccentric (ECC) muscle actions are a crucial part of movements that occur during everyday activities and during athletic competitions. Maximal ECC actions are up to 40% more forceful than maximal concentric (CON) actions and result in the greatest number of muscle injuries. ECC and CON seem to be controlled by different neural mechanisms. The purpose of this study was to determine effects of conditions, speeds, and muscle action on torque steadiness measured by plantar flexion torque and mean and peak/mean (P/M) EMG activity of the gastrocnemius and soleus muscles during an isokinetic action. Design and Settings: A MANOVA was used to determine differences between the condition (decreased dorsiflexion range of motion and post stretch), velocity (10°/s, 20°/s, 30°/s, 40°/s), and muscle action (CON and ECC). The dependent variables included coefficient of variation (CV), absolute error scores, mean EMG and P/M EMG for gastroc and soleus. Subjects: Fifteen participants (3 male, 12 female; age = 20.5 ± 2.7 years, height = 168.9 ± 6.1, mass = 67.6 ± 10.8) were tested. Measurements: Using the Kin-Com AP 125, subjects performed a torque steadiness test using 40% MVIC torque during an ISOK CON/ECC plantarflexion motion. The conditions were performed in a counterbalanced fashion including baseline (B), after stretch (PS), and decreased dorsiflexion range of motion (DRM). During PS, participants were passively stretched for 3 sets of 30 seconds for both the gastroc and soleus. The DRM used the same total ROM during the torque steadiness test but shifted to less DF and more PF (5 degrees). Results: Increasing velocity decreased torque steadiness, increased mean EMG activity, and decreased P/M EMG activity. The absolute error score after stretching increased without a change in EMG activity. The CON and ECC did not differ significantly for torque steadiness. Mean EMG activity was less for ECC than for CON; and P/M EMG activity was greater during the ECC. The combined effect of decreasing the muscle stiffness and the depressed neural feedback may have affected the absolute error scores in the stretching condition. However, decreasing the dorsiflexion range of motion and therefore decreasing the passive tension or stiffness of the muscle alone did not affect performance. Conclusion: Stretching appears to have an influence on motor control and may affect muscle performance during athletic activities. Underlying neural control mechanisms may be linked to muscle strains and improved prevention and rehabilitation techniques. Keywords: torque steadiness, eccentric, plantarflexion, Kin-Com