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## ***Differences in Static Postural Control Performance Between Athletes who are Hearing and Athletes who are Deaf or Hard-of-Hearing***

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### **OBJECTIVE**

To determine if differences exist in static postural control performance between athletes who are hearing and athletes who are deaf or hard-of-hearing (D/HoH).

### **DESIGN AND SETTING**

Cross-sectional design. Athletic training facilities.

### **PARTICIPANTS**

Varsity athletes who are D/HoH (n=41, 20.56±1.90 yrs., 1.73±0.08 m., 79.29±18.67 kg.) and university club-level athletes who are hearing (n=103, 20.08±1.62 yrs., 1.76±0.09 m., 78.20±12.26 kg.) volunteered to participate in the study.

### **INTERVENTION**

Participants completed static postural control assessments in double-limb stance with feet together and hands crossed over the chest under the following conditions: 1) eyes open (EO) on firm surface, 2) eyes closed (EC) on firm surface, 3) EO on foam surface, and 4) EC on foam surface.

### **MAIN OUTCOME MEASURE**

Center of pressure (CoP) data were collected on a tri-axial force plate. Total, anterior-posterior (AP), and medial-lateral (ML) CoP excursion, AP and ML CoP range, AP and ML

amplitude root-mean square (RMS), and sway area were calculated. Mixed-model ANOVAs were performed to test the effects of hearing status and condition on postural control. Alpha level was set *a priori* at  $p < 0.05$ .

### **RESULTS**

There was a main effect of condition on total, AP, and ML excursion, ML range, AP and ML RMS, and sway area ( $p < 0.01$ ). There was a main effect of hearing status on total ( $p = 0.03$ ) and ML ( $p = 0.01$ ) CoP excursion, ML range ( $p < 0.01$ ), ML RMS ( $p < 0.01$ ), and sway area ( $p < 0.01$ ). There was an interaction effect on AP range ( $p = 0.02$ ).

### **CONCLUSION**

Athletes who are D/HoH were less stable compared to athletes who are hearing. These differences may suggest implications of sensory deficits, specifically vestibular stimuli, between athletes who are hearing and athletes who are D/HoH. Baseline assessments of static postural control performance of athletes who are D/HoH may be necessary rather than using normative data from athletes who are hearing to evaluate performance and guide return-to-play decision making following injury.

**KEY WORDS:** *Balance, mCTSIB, Disability*