

# Validation of a dumbbell body sway test in olympic air pistol shooting

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We present and validate a test able to provide reliable body sway measurements in air pistol shooting, without the use of a gun. 46 senior male pistol shooters who participated in Spanish air pistol championships participated in the study. Body sway data of two static bipodal balance tests have been compared: during the first test, shooting was simulated by use of a dumbbell, while during the second test the shooters own pistol was used. Both tests were performed the day previous to the competition, during the official training time and at the training stands to simulate competition conditions. The participants performance was determined as the total score of 60 shots at competition. Apart from the commonly used variables that refer to movements of the shooters centre of pressure (COP), such as COP displacements on the X and Y axes, maximum and average COP velocities and total COP area, the present analysis also included variables that provide information regarding the axes of the COP ellipse (length and angle in respect to X). A strong statistically significant correlation between the two tests was found (with an interclass correlation varying between 0.59 and 0.92). A statistically significant inverse linear correlation was also found between performance and COP movements. The study concludes that dumbbell tests are perfectly valid for measuring body sway by simulating pistol shooting. © 2014 Mon et al.