

## Postural Stability during Static Upright Stance in Archers

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**ABSTRACT:** Archery is a static sport, where high postural stability, coordination of the body segments and high concentration of attention at the time of shot execution are most important to achieve high scores. We studied the postural stability of ten young male archers and fifteen healthy untrained age matched subjects during quiet and sensory-conflicted stance (standing on stable and foam support with open and closed eyes). We measured with a force platform the center of pressure excursions and calculate mean sway amplitude (MA) and mean sway velocity (SV) to evaluate static standing balance. The archers maintain the postural stability with postural sways with smaller amplitude and velocity than those of untrained subjects. We found that the visual control plays an insignificant role for keeping stable stance in archers, while the contribution of vestibular system for posture stability is substantial, especially when the visual input is switched off or proprioceptive information was altered and inadequate. The alteration of proprioception information plays a major role in keeping the static balance of archers and affects mainly the velocity of postural sway. The present results indicate that the systematic specific sport training of archers, including fixation of the posture and concentration upon the target, leads to stabilization of quiet upright stance, especially during stance on stable support compared to that of untrained subjects.

**KEYWORDS:** Postural control, equilibrium, archery, sensory conflict