Sample Abstract: DESCRIPTIVE STUDY (292 words)

Ground reaction and lower extremity joint forces produced during tap dance

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Introduction
An injury survey among experienced tap dancers suggested a low injury rate (0.31/1000 exposures) compared to similar surveys involving dance and sport activities. No tap dance biomechanics studies were discovered during a literature search. We hypothesized that tap dance might produce less musculoskeletal stress and performed a biomechanical analysis by measuring landing forces among a cohort of experienced tap performers.

Methods
Six professional tap dancers (3 male, 3 female, mean age 24.5 ± 10.6 years) volunteered for the study. All were injury-free, actively performing when tested, and signed an informed consent.

Each subject performed four tap dance sequences, repeated 4-8 times, on a force platform. A 5-camera motion analysis system with 39 reflective body markers and force platform were used to acquire relevant kinematic (movement) and kinetic (forces and moments) data.

Peak amplitude Fx (sagittal plane), Fy (frontal plane), and Fz (vertical plane) forces were measured for each of the four sequences and normalized to body weight (BW).

Results
Between-gender t-tests were not significantly different for any condition, so results for all subjects were merged for analysis. Mean peak Fx and Fy were insignificant (<1.0 BW) for all conditions. For the four sequences, Fz ranged from 1.16-4.19 BW (grand mean 2.12 ± 0.69).

Discussion
Landing forces are reported for walking (1.0-1.4 BW), running (1.6-3.6 BW), jumping (3.5-6.0 BW), gymnastics (9.0-14.5 BW), various sport activities (4.0-12.6 BW), aerobic dance (1.5-2.6 BW) and dance jump landings (1.4-2.8 BW). Fz occurring during tap dance are in the lower range of these activities. Although this finding appears to support our initial hypothesis, additional factors must be considered.

Conclusion
The relatively low Fz measured during tap dance may explain the apparent low injury occurrence rate among tap dance performers. Many other factors remain to be studied.