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Hall B

## **Bilateral Comparison of Propulsion Mechanics during Single Leg Vertical Jumping: 2302: Board #82 May 30 3:30 PM - 5:00 PM**

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**PURPOSE:** To compare single leg vertical jump propulsion mechanics between the dominant (DOM) and non-dominant (NDOM) limbs.

**METHODS:** After a standardized warm-up, 20 (10 men, 10 women) physically active (Tegner score=6.5±1.7, range:4-9) young adults (21.7± 2.1yrs) performed three single leg DOM and three single leg NDOM vertical jumps in random order. Ground reaction forces were collected during each trial and used to establish vertical force, velocity, displacement, and power curves. Five variables were calculated: jump height (based on takeoff velocity), depth of countermovement (DCM), peak force (PF) normalized to body weight (BW), peak positive power (PPP) normalized to BW, and the ratio of negative to positive impulse. Bilateral comparisons and correlations, were conducted using trial one data, while reliability of the variables was assessed across the three trials using intraclass correlation coefficients (2,1) and standard error of measurement (SEM).

**RESULTS:** A non-significant trend (P=.057) for greater jump height was identified for the NDOM (15.6±4.5cm, 95% CI:13.5-17.7cm), versus DOM (14.7±3.9cm, 95% CI:12.9-16.5cm) limb. The other variables were statistically (P>.05) equal bilaterally. There was high positive correlation between jump height and PPP for both DOM (r=.915, P<.001) and NDOM (r=.944, P<.001) jump height. Other variables related to jump height were vertical maximum positive ground reaction force (DOM: r=.486, P=.03, NDOM: r=.513, P=.021) and DCM (DOM: r=.407, P=.075, NDOM: r=.495, P=.027). Results of the reliability analyses demonstrated highest reliability (ICC,SEM) for jump height (DOM=.974, 1.16cm; NDOM=.919, 1.30cm), PPP (DOM=.871, .195W/BW, NDOM=.880, .196W/BW), and PF (DOM=.738, .111BW, NDOM=.755, .100BW).

**CONCLUSION:** The results suggest that near equal jump heights may be expected when conducting bilateral comparisons in healthy individuals. Similar to previous reports examining double leg vertical jumping, PPP appears to be the best predictor of jump height followed by PF. Bilateral comparison data can be used as guidelines for preseason screening to identify potential asymmetry, guidelines for criteria for serial assessment for exercise prescription and rehabilitation and parameters for discharge for rehabilitation.

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