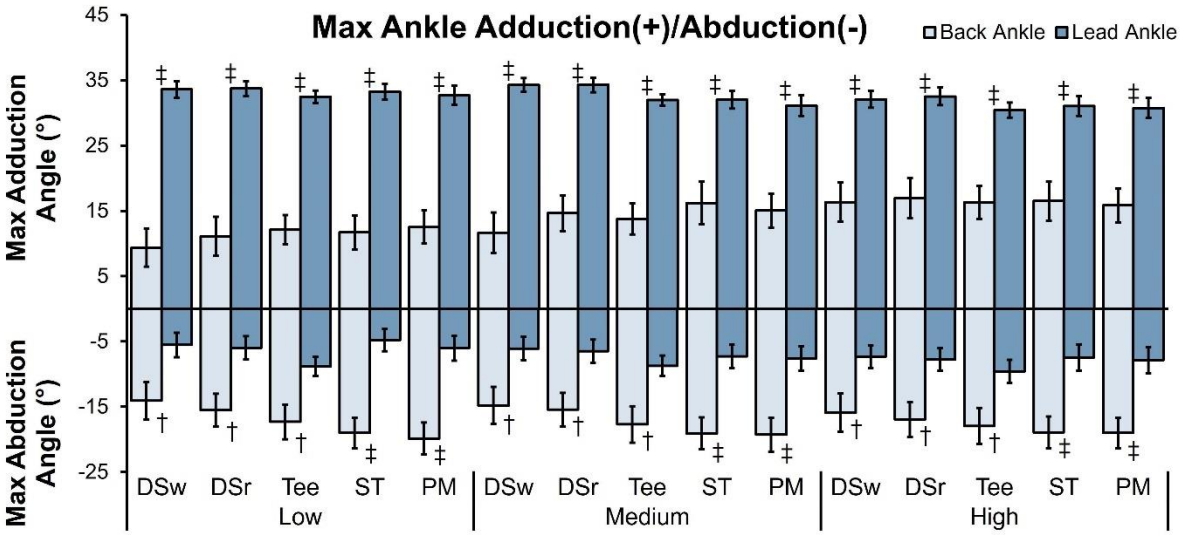

Figure 1: Maximum ankle Adduction(+) and Abduction (-) achieved in the back and lead ankle over the course of a swing for 15 combinations of swing type and effort level. †,‡ Significant difference in maximum values of abduction or adduction between lead and back ankle for a given combination of swing type and effort at $p<0.05$ and $p<0.001$, respectively.

Major League Baseball

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Isotonic Exercises Associated With Swing Speed And Exit Velocity In Baseball Players

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Bat speed and exit velocity predict success in baseball batters. Understanding the exercises that promote these outcomes can help optimize training programs.
PURPOSE: To test the relationship between 3D isotonic exercises and baseball swing performance.
METHODS: We tested 129 male baseball players using a Proteus device, recording peak power and velocity in 15 exercises: unilateral press and row, rotational punch, torso rotation with and without plyometric loading, D2 flexion and extension, lateral bound, and vertical jump. Rotational punch and plyometric rotation were only performed on the dominant side. All other exercises except vertical jump were performed on both sides. Dependent variables were hand rotational speed assessed by a K-Vest and exit velocity (mean and peak) measured by a Trackman monitor. Linear regression models tested relationships between exercise performance and dependent variables holding age, height, and weight constant wherever significant.
RESULTS: Hand rotational speed was 1,518.3 ± 206.6 °/s, mean exit velocity was 74.8 ± 11.7 mph, and peak exit velocity was 78.5 ± 9.6 mph. Predictors of mean exit velocity (R^2=0.608; $p<0.001$) were non-dominant D2 extension velocity (p=0.066; 95% CI: -0.040, 1.212), plyometric torso rotation power (p=0.048; 95% CI: 0.000, 0.043), and rotational punch power ($p<0.001$; 95% CI: 0.020, 0.059). The variance inflation factor (VIF) was 1.8 for each exercise. Predictors of peak exit velocity (R^2=0.800; $p<0.001$) were dominant D2 extension velocity (p=0.011; 95% CI: 0.079, 0.609), plyometric torso rotation power (p=0.018; 95% CI: 0.003, 0.028), rotational punch power ($p<0.001$; 95% CI: 0.014, 0.039), and vertical jump power (p=0.018; 95% CI: 0.012, 0.124). VIF values ranged between 1.8-2.2. Predictors of hand rotational speed (R^2=0.282; $p<0.001$) were plyometric torso rotation power (p=0.026; 95% CI: 0.073, 1.120), dominant unilateral press (p=0.024; 95% CI: 1.125, 17.431), dominant D2 extension power (p=0.024; 95% CI: 0.326, 4.527), and non-dominant D2 flexion power (p=0.001; 95% CI: -4.280, -1.072). VIF values ranged between 1.8-3.3.
CONCLUSIONS: Dominant plyometric torso rotation predicted all outcomes. Secondary exercises were dominant and non-dominant D2 extension, dominant rotational punch, dominant unilateral press, and vertical jump.

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Biomechanical And Musculoskeletal Characteristics In Child And Adult Bharatanatyam Dancers

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Bharatanatyam is a classical Indian dance that involves high impact movements. Knowledge of injury prevalence, musculoskeletal, and biomechanical characteristics of Bharatanatyam dancers can help educate dancers about injury prevention and rehabilitation.