



# Hindfoot Position Correction Effect on Exit Velocity in Collegiate Baseball Players



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## Statement of Purpose

The biomechanics of baseball have been well documented including the role of the posterior kinetic chain. However the specifics of the role of the subtalar joint, further, the use of corrective hindfoot devices to allow for increased ground reactive forces has not been studied. The authors hypothesize that the use of corrective shoe gear which promotes ground reactive forces will have an effect on exit velocity.

### Methodology & Procedure

A baseline hindfoot position of 38 collegiate level baseball players (Georgetown College Athletics, Georgetown, KY) was evaluated on the field using a pressure mat system (RAPID-Sports, Cleveland, OH, USA) along with the corresponding exit velocity (YakkerTech, Phoenix, AZ, USA) of an average of three swings with no corrective shoe gear. The players then took another three swings while donning the corrective shoe gear (SQAIRZ, Windham, NH, USA), and the corrected exit velocity was also measured. A t-test was conducted with the obtained data to determine the statistical significance between the data sets.

Table Key:

AVG: Average velocity of 3 swings with generic shoes  
AVG\*: Average velocity of 3 swings with corrective shoe  
Delta: Change in velocity

AVG	AVG*	Delta	AVG	AVG*	Delta
81.5	88	6.5	96.5	95	-1.5
83.2	85	1.8	88.0	97	9.0
90.4	96	5.6	70.1	86	15.9
87.2	90	2.8	88.3	89	0.7
82.3	87	4.7	89.1	94	4.9
88.7	88	-0.7	85.4	85	-0.4
78.0	90	12.0	78.8	84	5.2
85.8	87	1.2	87.7	85	-2.7
97.2	98	0.8	87.3	85	-2.3
90.4	84	-6.4	89.7	86	-3.7
80.9	87	6.1	90.3	95	4.7
81.5	80	-1.5	85.4	84	-1.4
83.7	89	5.3	88.7	84	-4.7
97.8	101	3.2	84.6	84	-0.6
84.8	88	3.2	88.9	85	-3.9
80.0	83	3.0	77.0	84	7.0
82.6	96	13.4	83.3	82	-1.3
76.3	92	15.7	93.5	90	-3.5
93.4	96	2.6	84.5	80	-4.5

### Results

60.5% of players (n=23) experienced an improvement to their exit velocity with corrective shoe gear (p=0.007).

### Analysis & Discussion

This study has shown there is a correlation between increased ground reactive forces of the hindfoot with batting exit velocity, which has implications about the role of the subtalar joint in the various phases of the baseball swing. From this data, the position of the hindfoot should be considered when training athletes for improved performance. Future studies are indicated in examining the mechanics of the shoes and isolating other variables including foot type and specifics to the degree of increased GRF and HF correction provided by the shoe gear.

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