

INFLUENCE OF SHOULDER RANGE OF MOTION AND STRENGTH ON TENNIS FOREHAND VELOCITY IN COLLEGIATE ATHLETES. Schaeffer B, Brown A, Cruz H, Freeman S, Martin B, Nickerson C. Hardin-Simmons University Department of Physical Therapy, Abilene, TX.

PURPOSE: (1) To investigate the relationships between shoulder muscle strength and range of motion (ROM) to ball velocity during a tennis forehand swing. (2) To predict forehand velocity from shoulder muscle strength, range of motion, height, weight, and gender.

SUBJECTS: Thirty-nine (M=19, F=20) D-1 and D-3 collegiate level tennis players volunteered for the investigation.

METHODS: Subjects signed an IRB-approved informed consent and completed an injury history survey prior to testing. Baseline measurements included height and weight. Goniometric ROM and J-Tech Onsite Commander isometric muscle strength measurements were completed on the dominant (hitting) arm which included external rotation (ER), internal rotation (IR), and horizontal adduction (Hor Add). Following a 6-minute warm up (3-minute jog and stretch and 3-minute hitting on ball machine), subjects were fed a series of balls (from ball machine) to their dominant side for a forehand swing until three inbounds crosscourt hits were recorded. A calibrated Stalker Pro Radar Gun was used to measure ball velocity.

Statistical Analysis: Bivariate correlations (SPSS-25) were used to determine the relationships between isometric muscle strength, ROM, and maximum ball velocity. Multiple Regression (total and partial) was used to determine the relationships between isometric muscle strength, ROM, and maximum ball velocity.