

## Ball Release Velocity and Pre-Release Range of Motion for Five Types of Softball Pitches

Tara Bicko & Ben Meyer, Shippensburg University, Shippensburg, PA

Softball pitchers utilize several types of pitches, but previous research has focused primarily on the fastball technique. **PURPOSE:** The purpose of this study was to build upon previous findings for the fastball, change-up, and screwball pitches by adding information about ball release velocity (VR) and pre-release range of motion (ROM) for the curveball and riseball techniques. **METHODS:** Five female NCAA Division II softball pitchers participated in the study. Participants performed five pitches for each of the five pitch types. The velocity of the ball was computed from videos of the pitches using Logger Pro software. The three best attempts for each pitch type (based on VR) were used in the analysis. Differences between measures were tested for statistical significance using ANOVA (criterion of  $p = 0.05$ ). **RESULTS:** Figure 1 shows that pitchers achieved the largest VR values using the fastpitch ( $26.2 \pm 1.4$  m/s), while the smallest VR values were obtained using the change-up ( $18.7 \pm 1.6$  m/s). The fastball, screwball, curveball, and riseball VR values were not significantly different from each other, but VR values for the change-up technique were significantly smaller than all the other techniques. Figure 2 shows the relationship between VR and ROM for all pitch types. Excluding the change-up technique, results show that an increase in ROM leads to an increase in VR. **CONCLUSION:** For a small sample of NCAA Division II softball pitchers, release velocities are very similar (24-26 m/s) for the fastball, screwball, curveball and riseball pitch types. The change-up pitch has distinct VR and ROM characteristics and future studies should investigate other factors that make the change-up such a unique pitching style.

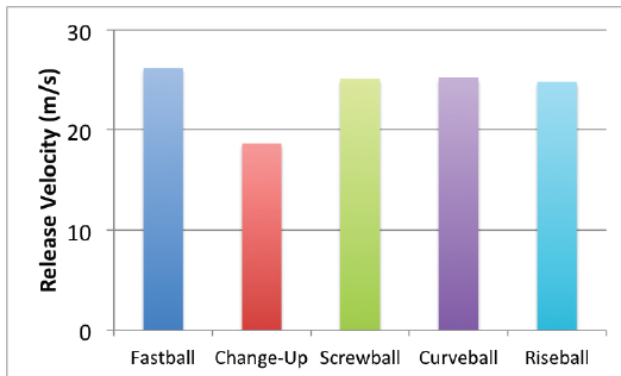


Figure 1. Ball release velocities for the five pitch types analyzed in the study.

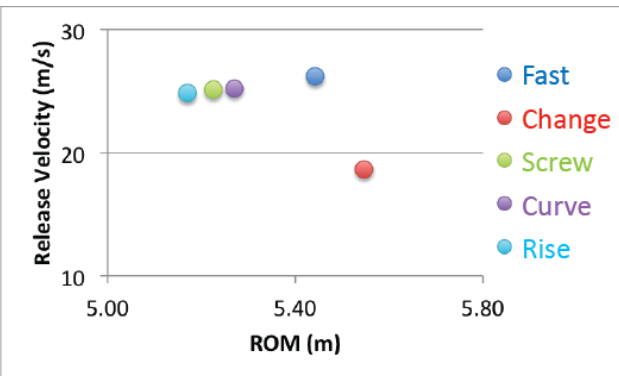


Figure 2. Relationship between ball release velocity and pre-release range of motion.