


## Abstract

**Purpose:** Previous baseball pitching studies have compared kinematics parameters among fastball, curveball, and slider, but did not indicate more stressful for collegiate pitchers. The purpose of this study was to compare kinematics data of upper extremity among fastball, curveball, and slider potentially dangerous. **Methods:** Twenty-four collegiate baseball pitchers volunteered in this study. After signed informed consent and placed forty-eight reflective markers on head, upper extremities and lower extremities, participant threw in a total of fifteen fastball, curveball, and slider randomly from pitcher plate marker to the target five meter away. Repeated measurement ANOVA was used to test differences of kinematic parameters among fastball, curveball, and slider. **Results:** Eleven of twenty-two parameters showed significant differences. Another eleven parameters at foot contact, arm cocking, arm acceleration, and ball release displayed no significant differences based on kinematics comparison. Overall, kinematics analysis among fastball, curveball, and slider did not exhibited significant differences. Ball speed at fastball was faster compared to curveball and slider. Fastball was also dominant at foot contact and arm acceleration, while curveball take over domination in ball release at arm deceleration phases compared to fastball and slider. **Conclusions:** Understanding of kinematic differences can help pitcher to select and learn different pitches. Pitcher should master the basic mechanics before he goes to the next level. This information may be used as guidelines to the coaches and pitchers to improve performance and injury prevention.

## Reference

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