

Take Me Out of the Ballgame: Recovery from Pitching Injuries in the MLB

School of Applied Health

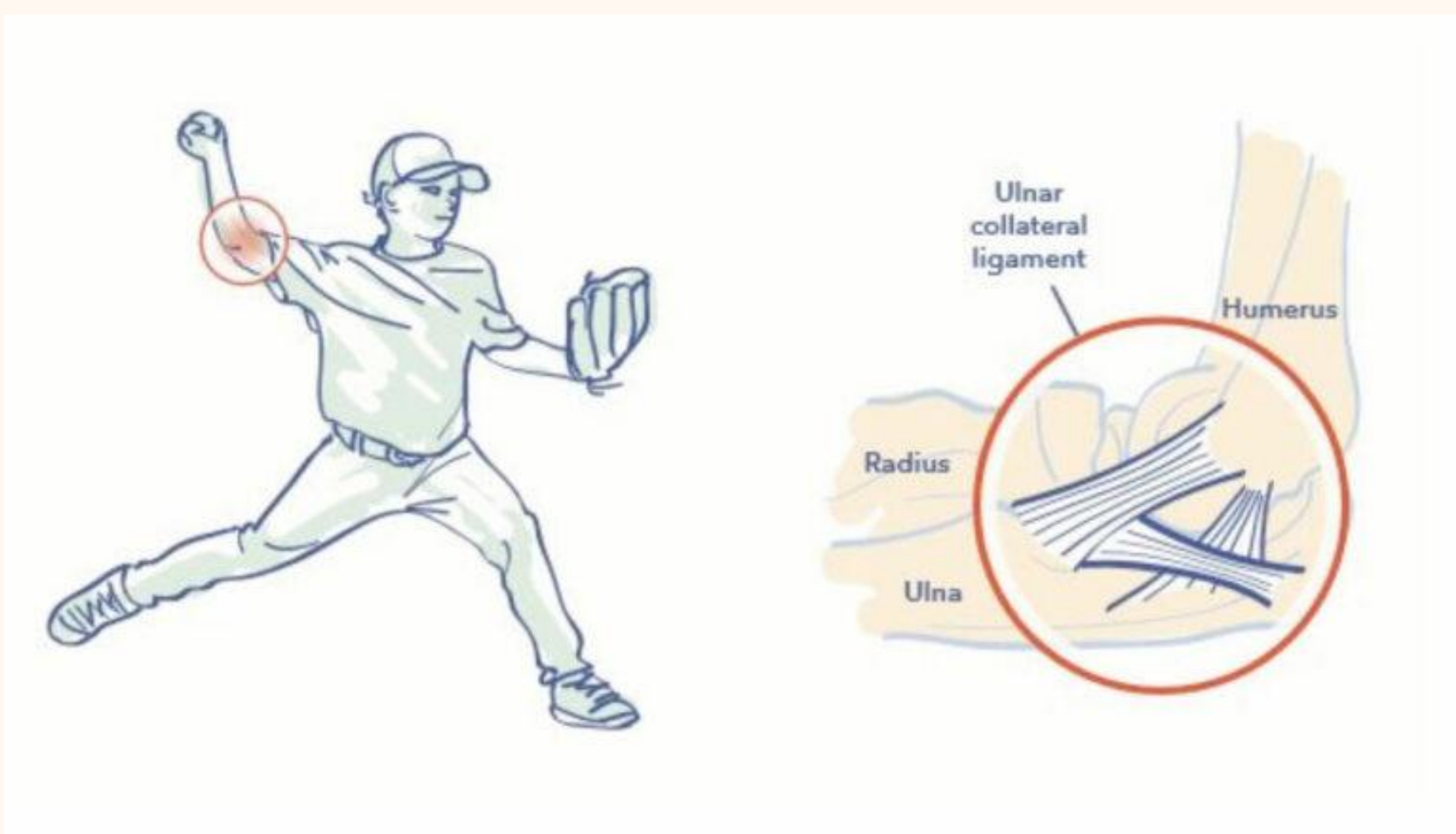
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Introduction

- Pitching is a highly complex, high-velocity movement that places substantial stress on the shoulder and elbow joints. Repetitive exposure to these stresses has been associated with overuse injuries, especially in Major League Baseball (MLB) (LaPrade et al., 2022).



- The purpose of my project is to examine how throwing mechanics influence injury risk and return to play in professional baseball players.
- I aim to identify factors that may increase injury risk and injury prevention strategies.
- How do specific biomechanical characteristics of pitching/throwing contribute to increased injury risk in the shoulder and elbow.

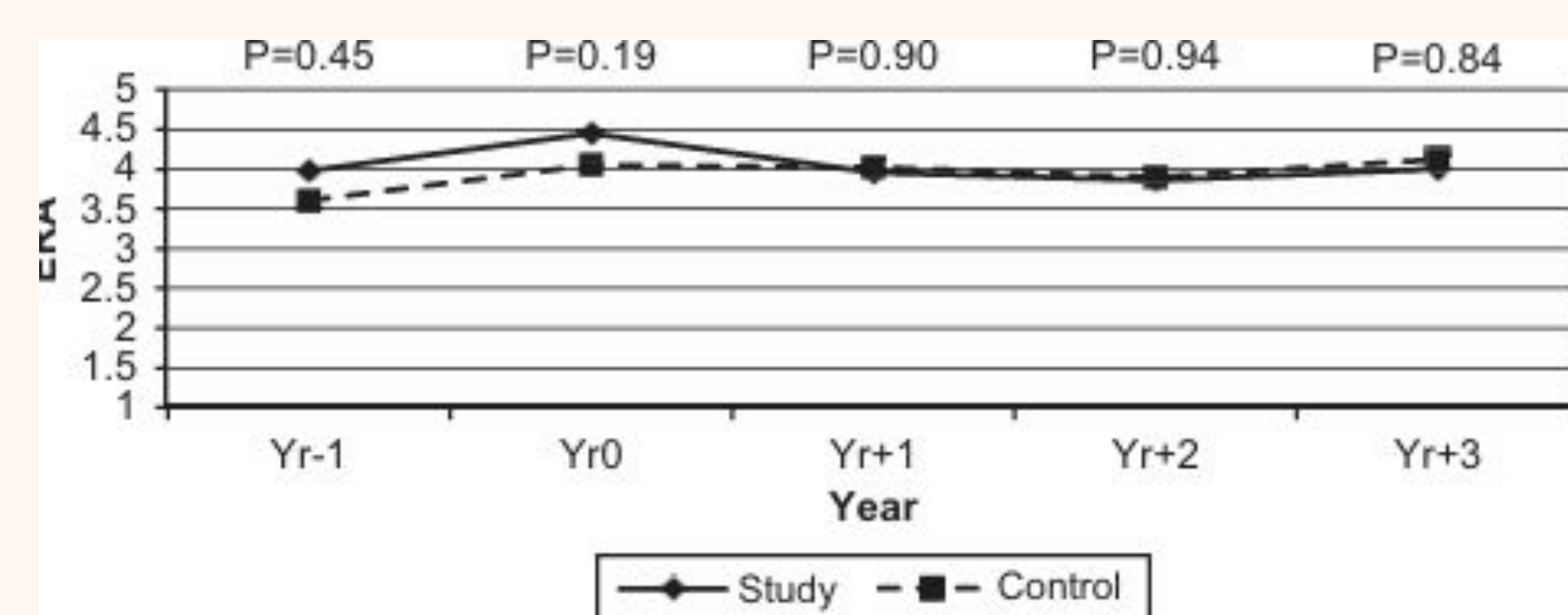


Methods

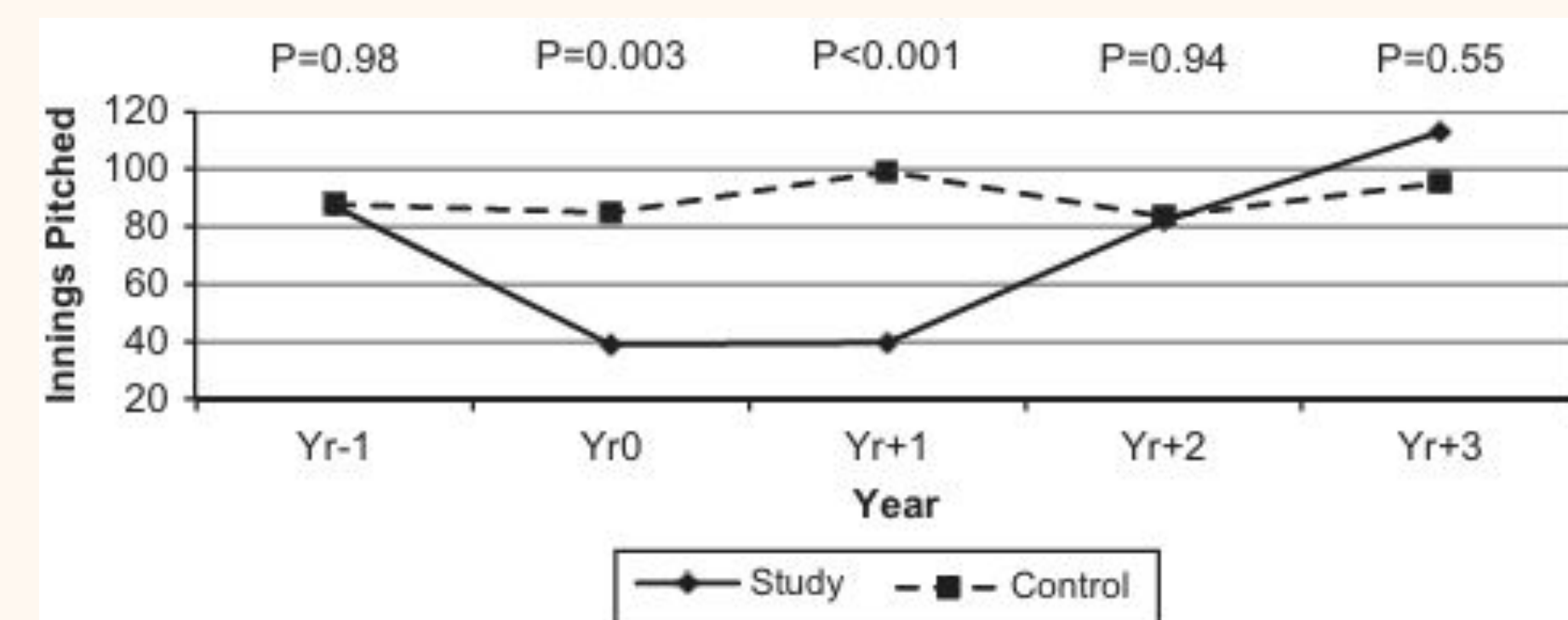
- To locate relevant scientific articles, Google Scholar was used. Search terms included combinations of: “baseball pitching biomechanics,” “fatigue pitching mechanics,” “elbow valgus torque,” and “workload injury baseball pitchers.”

Results

- The mean percentage change in the velocity of pitches thrown by players who underwent UCL reconstruction was not significantly different compared with players in the control group. The mean innings pitched was statistically different only for the year of injury and the first postinjury year. (Jiang & Leland, 2014).



- ERA: Average number of earned runs a pitcher allows divided by 9 innings
- Jiang, J. J., & Leland, J. M. (2014)



- Jiang, J. J., & Leland, J. M. (2014)

- The rate of return to the preinjury level of competition was 79%, with a median time of return to MLB play of 15 months (mean, 17.1 months; range, 11-27 months) after surgery (Jiang & Leland, 2014).
- UCL reconstruction reported a 73% to 94% rate of return to play at a level that is comparable with the preinjury level of performance (Jiang & Leland, 2014).

TABLE 2
Mean Pitch Velocity and Mean Change in Velocity Compared With the Index Year for the Study Group

Year	Mean Velocity, mph	Change in Mean Velocity, mph	P Value	95% CI
Preinjury year (year -1)				
Fastball	91.5	0.4	.45	-0.10 to 0.88
Changeup	83.0	1.0	.05	0.02 to 1.98
Curveball	79.2	1.0	.07	-0.07 to 2.07
Slider	83.2	0.7	.10	-0.16 to 1.47
Index year (year 0)				
Fastball	91.1	—	—	—
Changeup	82.0	—	—	—
Curveball	78.2	—	—	—
Slider	82.6	—	—	—
Postinjury years				
Year +1				
Fastball	89.7	1.3	<.001	0.78 to 1.88
Changeup	80.7	1.2	.02	0.25 to 2.19
Curveball	77.6	0.5	.42	-0.87 to 1.93
Slider	82.1	0.4	.23	-0.31 to 1.18
Year +2				
Fastball	88.7	1.0	<.001	0.54 to 1.52
Changeup	79.5	1.3	.02	0.21 to 2.28
Curveball	76.7	1.0	.03	0.13 to 1.76
Slider	81.6	0.6	.10	-0.12 to 1.29
Year +3				
Fastball	87.7	1.0	.01	0.26 to 1.78
Changeup	78.5	1.0	.03	0.11 to 1.80
Curveball	75.0	1.7	.004	0.63 to 2.70
Slider	81.2	0.3	.45	-0.55 to 1.22

- Jiang, J. J., & Leland, J. M. (2014) pg 883.

Conclusions

- Throwing volume, proper throwing mechanics, and appropriate rehabilitation are likely to be the most influential on mitigating unnecessary stresses imparted to the elbow in the throwing athlete (Triplet et al., 2022).

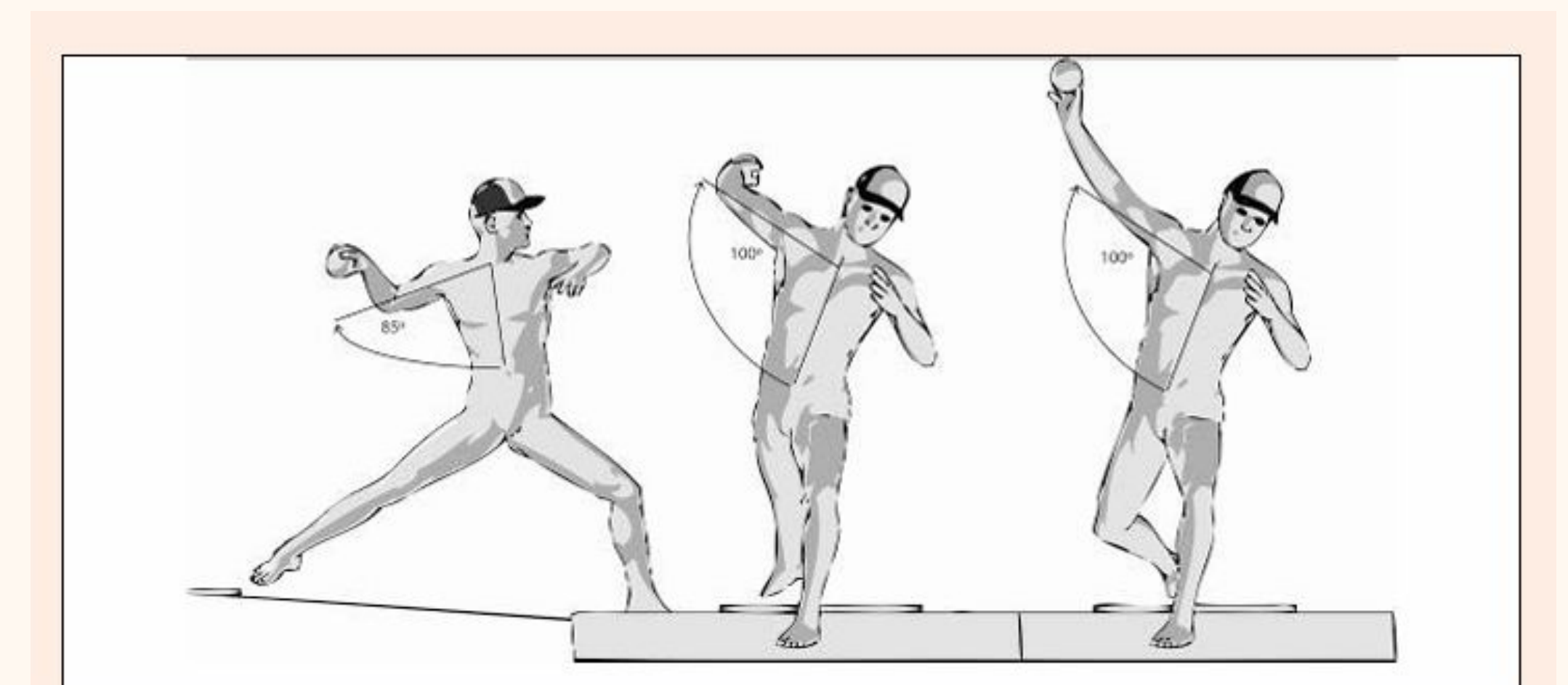


Figure 10. Arm abduction during pitching from the point of Stride foot contact to Maximum External Rotation, and then to release. Whiteley, R. (2007).

- UCL reconstruction allows MLB pitchers to return to play without significant loss in velocity or performance, although early workload is reduced and full return is not guaranteed (LaPrade et al., 2022).
- UCL reconstructed pitchers pitch significantly more fastballs than controls (Prior to injury) (46.7% vs. 39.4%, P = .035). This correlated to a 2% increase in risk for UCL injury for every 1% increase in fastballs thrown.
- Pitching more than 48% fastballs was a significant predictor of UCL injury, because pitchers over this threshold required reconstruction (P = .006) (Keller et al., 2016).

References

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