Frequency of Tommy John Surgery in Division I College Pitchers versus Weather Conditions

Sabrina M. Pescatore, MSc, BS[1], Sterling J. DeShazo, BS[1], William M. Weiss, MD, MSc, FRCSC, FAAOS[2]
[1]John Sealy School of Medicine, The University of Texas Medical Branch, Galveston, TX
[2]Department of Orthopedics and Rehabilitation, The University of Texas Medical Branch, Galveston, TX
smpescat@utmb.edu

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INTRODUCTION: Ulnar Collateral Ligament Reconstruction (UCLR), or Tommy John Surgery, is a common elbow procedure in baseball pitchers that is also on the rise. Previous studies of Major League Baseball players have identified weather as a possible contributing factor, since warmer climates allow for more annual playing time, increasing the risk of overuse injuries. This study aims to determine if weather conditions play a role in UCLR rates and timing for NCAA.

METHODS: A total of 320 NCAA Division I college baseball pitchers who underwent UCLR surgery between 07/01/2015 and 06/30/2022 were analyzed. The climate of their respective colleges was classified as either warm or cold based on their location versus the 33rd parallel line in North America and their player year classification was noted. The average number of DI teams per season was 296. The total number of DI players was 76,706. A two-sample independent T-test was used to compare the average UCLR rate for players in warm versus cold climate states.

RESULTS SECTION: Out of the 320 total UCLRs, 158 were in warm states (49.4%) and 162 were in cold states (50.6%). However, the average UCLR rate per pitcher in warm states was significantly more (0.0057) compared to cold state pitchers (0.0033) (p=0.0001). The highest number of UCLRs in warm states occurred during sophomore year (57, 36.1%), while the highest number of UCLRs in cold states occurred during junior year (63, 38.9%).

DISCUSSION: Our analysis shows that Division I college pitchers who play in warm climate states undergo UCLR surgery significantly more often and earlier in their collegiate careers than pitchers playing in cold climate states.

SIGNIFICANCE/CLINICAL RELEVANCE: This study highlights the need for baseball pitchers to manage their cumulative, repetitive overhead motion by regulating practice and game frequency--not just as college players but also as adolescents--to mitigate risk of UCL injury and reconstruction surgeries.

IMAGES AND TABLES:

Table 1
Warm and cold climate US states based on location versus the 33rd parallel

Warm States with DI Baseball Programs	Cold States with DI Baseball Programs
n=11 Alabama, Arizona, California, Florida, Texas, Georgia, Hawaii, Louisiana, Mississippi, New Mexico, South Carolina	**n=36** Arkansas, Colorado, Connecticut, Delaware, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Virginia, Washington, Washington D.C.,West Virginia, Wisconsin
Warm States Without DI Baseball Programs	**Cold States Without DI Baseball Programs**
n=0	**n=4** Alaska, Montana, Wyoming, Vermont

Figure 4
Percentage of warm state players versus percentage of warm state UCLRs for 2015-16 to 2021-22 seasons

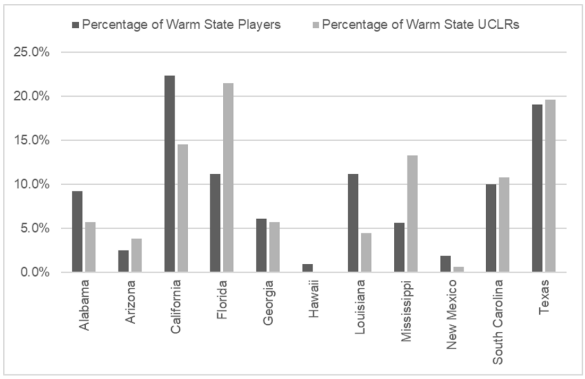

Table 2
UCLRs by player year and warm versus cold weather state

Player year	Total UCLR		Warm state UCLR		Cold state UCLR	
Freshman	80	25.0%	42	26.6%	38	23.5%
Sophomore	106	33.1%	57	36.1%	49	30.2%
Junior	105	32.8%	42	26.6%	63	38.9%
Senior	29	9.1%	17	10.8%	12	7.4%
Total	320	100%	158	100%	162	100%