Correlation between Clinical Mobility Examination and Pitching Mechanics in Youth Baseball Pitchers with Shoulder and Elbow Pain.

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Background: Shoulder and elbow pain in youth baseball pitchers is a well-recognized phenomenon. Increased number of pitches, early use of breaking balls, and year-round playing has been implemented as potential causes of these complaints. Improper pitching mechanics has also been suggested as a possible risk factor. There is a need for pitching instruction that combines the scientific validity of a motion analysis laboratory, clinical video analysis, and a correlation to upper and lower quadrant mobility deficits specific to the pitching motion.

Purpose: Compare specific upper and lower quadrant mobility deficits with pitching mechanic abnormalities that together pre-dispose youth baseball pitchers to overuse injuries. Propose screening for clinician that is pitching specific and allow for better understanding of altered throwing mechanics.

Case Description: A series of youth pitchers self-referred to clinic with shoulder or elbow pain (n=10; ages 12-15) from previous pitching performance. Each underwent a performance sports physical therapy evaluation and pitching mechanical assessment. Each subject was found to have limited IR (GIRD), decreased scapulothoracic posterior depression and endurance (late cocking phase strength), and limited hamstring flexibility (follow through). Upon mechanical assessment, each subject was found to be deficient in at least 2 out of 5 of normal pitching mechanical standards (Balance at top of windup, stride direction, lead foot land angle, elbow position at lead foot contact, and finish position (follow-through). Subjects were placed on corrected exercises, filmed to address pitching mechanical issues at each visit, and seen once a week for 6-8 sessions. Subjects were also placed on return to throwing program during this period and progressed back to the mound.

Outcomes: All pitchers demonstrated improved strength and flexibility gains from the initial evaluation. All pitchers also demonstrated improved pitching mechanics and increased knowledge on altered mechanics which placed additional stress on the throwing arm (shoulder and elbow). Strength assessments were based on manual muscle testing and video assessment of quality of movement on last rep demonstrating improved endurance. Goniometric measurement were used to document improvement on flexibility deficits. Mechanical improvements were based on video analysis at each visit. Each subject was able to return to the mound symptom free.

Discussion: Shoulder and elbow pain are common in youth pitchers because of cumulative micro-trauma of the throwing motion. During this time, young pitchers are

also learning improved pitching mechanics to help improve speed and efficiency. The physical therapist that understands basic pitching mechanics (normal and altered) along with common muscle and flexibility imbalances of the pitcher can tailor the exam and plan of care specific to this functional activity. A proposed pitching specific movement analysis is recommended for further study.