

In pitching injuries, the elbow is connected to the hip bone

May 1 2014, by Morgan Sherburne

(Medical Xpress)—New University of Florida research suggests that a pitcher's elbow injury could be linked to movement in the hips. Dr. Kevin W. Farmer, an assistant professor in the UF department of orthopaedics and rehabilitation, presented research at the March meeting of the American Academy of Orthopaedic Surgeons that shows a limited range of motion in a pitcher's hips could be a risk factor in injury to his elbow.

"This could open up a whole new line of thought processes and research," Farmer said. "We're going to be able to ask: Is there an associated risk of injury down the road with limited hip range of [motion](#), and can we minimize that risk by improving hip range of motion?"

When a pitcher throws, he begins by shifting weight on his feet. He then lifts one knee—the leg opposite his throwing arm—so his thigh is parallel with the ground. Simultaneously, he brings the ball behind his shoulder and begins the pitch, bringing his throwing hand over his shoulder at the same time his raised knee is coming down. That step forward helps power the pitch.

When the pitcher performs a pitch, much of the stress is focused on a single ligament: the ulnar collateral ligament of the [elbow joint](#). About 1,000 pounds of pressure per square inch can be placed upon that ligament, Farmer said. The mechanics of the throw affect what Farmer and his colleagues call the "elbow valgus torque."

"Most studies have looked at shoulders and elbows. While very few studies have looked at lower extremities, some have done early work looking at range of motion, but no one has really correlated hips with the risk of injury to the elbow," Farmer said.

To test how a pitcher's hip range of motion affected his elbow, Farmer and his fellow researchers tested the pitching style of seven college Division 1 athletes in a biomechanical throwing analysis. The analysis took place in a lab that has a pitching mound surrounded by [high-speed cameras](#). The researchers placed motion-detecting markers on the [pitchers'](#) joints. When the pitchers threw, the markers note the mechanics of their motion and the high-speed cameras took visuals. The results were made into a computerized, 3-D stick figure. Farmer and colleagues then analyzed all angles, speed and torques of the pitch, as well as how the different parts of the throw interacted with one another.

Certain aspects of the throwing cycle increase the risk of torquing that elbow ligament, said Farmer, such as the pitcher hyperextending his arm when he throws, whether his shoulder is too far back when he throws or whether the pitcher is opening his body toward home plate too soon. So the UF researchers correlated the hip range of motion to what they already knew could risk injury, and found that the less range of motion in their hips that pitchers had, the higher the risk to the pitchers' arms. Pitchers unknowingly compensate for limited range of motion in their hips, which could place more torque on their elbows.

Pitchers with injured [elbow](#) ligaments often undergo a reconstructive surgery called the Tommy John surgery.

"The fact is, some of these pitchers don't get back to the level they were at before their injury," Farmer said.

Farmer said that coaches and athletic trainers could easily help athletes

improve the flexibility in their hips. On deck for his group's research: Following pitchers over a period of time to determine whether there are changes in their ranges of motion over their careers, and whether a stretching program can improve range of motion and reduce the risk of injury.

Provided by University of Florida

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