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### Observational Studies

## Associations Among Hip and Shoulder Range of Motion and Shoulder Injury in Professional Baseball Players

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### Abstract

**Context:** The overhead throwing motion is complex, and restrictions in range of motion (ROM) at the hip may place additional demands on the shoulder that lead to injury. However, the relationship between hip and shoulder ROM in athletes with and without a history of shoulder injury is unknown.

**Objective:** To (1) determine if differences exist in hip and shoulder ROM between professional baseball players with a history of shoulder injury and those with no history of shoulder injury and (2) assess relationships between hip and shoulder ROM in these players.

**Design:** Cross-sectional study.

**Patients or Other Participants:** Fifty-seven professional baseball players.

**Main Outcome Measure(s):** Outcome measures consisted of hip extension and internal rotation, shoulder internal and external rotation, glenohumeral internal-rotation deficit, and history of shoulder injury. Differences in shoulder and hip ROM were assessed with a 1-way analysis of variance. Associations between hip and shoulder ROM were assessed with linear regression.

**Results:** Nonpitchers with a history of shoulder injury had more external rotation and less internal rotation of the shoulder than nonpitchers with no history of shoulder injury. Glenohumeral internal-rotation deficit was greater in both pitchers and nonpitchers with a history of shoulder injury. The relationship between dominant hip extension and shoulder external rotation was significant for pitchers with a history of shoulder injury and nonpitchers with a history of shoulder injury.

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**Conclusions:** Shoulder injury may be associated with specific measures of hip and shoulder ROM, and hip extension and shoulder external rotation may be related in baseball players with a history of shoulder injury. Additional research is necessary to understand the specific mechanisms of shoulder injury in the throwing athlete.

**Keywords:** [throwing athletes](#), [injuries](#), [glenohumeral internal-rotation deficit](#), [kinetic chain](#)

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