

# REFERENCE VALUES FOR GLENOHUMERAL JOINT ROTATIONAL RANGE OF MOTION IN ELITE TENNIS PLAYERS

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## ABSTRACT

**Background:** Due to the repetitive overhead activity involved in playing tennis and the physical demands of the game, shoulder joint injury is common. There is limited research available describing sport specific risk factors for injury in tennis, however, changes in shoulder rotational range of motion (ROM) have been associated with injury in other overhead 'throwing' type sports.

**Purpose:** This study had two purposes: i) to identify reference values for passive glenohumeral joint rotational ROM in elite tennis players, and, ii) to investigate differences in ROM between various age groups of players.

**Study design:** Cross-sectional analysis.

**Methods:** Data was collected at national performance camps held at a National Tennis Centre between September 2012 and July 2015. One hundred and eighty-four tennis players aged between 11 and 24 years took part. All had a top eight national ranking within their respective age group. Participants were divided into three age groups; under 14 years, 14-15 years, and 16 years and over. The main outcome measures were dominant and non-dominant internal and external rotation as well as total glenohumeral joint passive ROM.

**Results:** Reduced internal, and greater external rotation passive ROM were identified on the dominant side ( $p < 0.05$ ), however, no side-to-side differences in total rotation ROM were found ( $p > 0.05$ ). A glenohumeral joint internal rotation deficit (GIRD) was prevalent on the dominant side, which increased in magnitude with rising player age. Differences in dominant side internal and external rotation ROM were identified between age groups with the 14-15-year olds having less internal and greater external rotation than the under 14-year olds and the over 16-year old athletes ( $p < 0.05$ ). The total range of motion values were not found to differ between age groups ( $p > 0.05$ ).

**Conclusions:** This study provides reference values for glenohumeral joint rotational ROM in elite tennis players and demonstrates age specific differences. Future studies should investigate links between changes in ROM and injury risk.

**Level of evidence:** 3

**Keywords:** Glenohumeral joint, overhead athlete, range of motion, tennis

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The authors declare that there is no conflict of interest