Epidemiology of Shoulder Instability Injuries in Collegiate Contact Sports in the United States from 2009-2014

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Contact/collision athletes have the highest shoulder instability rates among all collegiate athletes.

No studies have evaluated the types, mechanisms, or severities of shoulder instability injuries in this population.

Outcomes have not been compared between Divisions I-III.

The purpose of this study was to evaluate the epidemiology of shoulder instability injuries in contact collegiate athletes (men’s football, ice hockey, lacrosse, and wrestling) and compare outcomes between levels of competition.
Methods

- Data from academic years 2009-2010 through 2013-2014 were obtained from the National Collegiate Athletic Association Injury Surveillance Program.

- Men’s wrestling, men’s football, men’s lacrosse, and men’s ice hockey were included in the cohort.

- One athlete-exposure (AE) was one student-athlete participating in one NCAA-sanctioned practice or competition.
Methods

• Shoulder instability incidence rates (IR) per 100,000 AEs were calculated with 95% confidence intervals.

• Injury proportion ratios (IPR) were used to quantify differences between injuries sustained during practice vs. competition.

• Analysis of variance and $\chi^2$ were utilized to compare time lost and surgery rates, respectively, between divisions.
Results

• 445 shoulder instability injuries occurred in 1,421,561 AEs.

• Wrestling (IR, 35.56) and football (IR, 35.14) experienced the highest shoulder instability incidence.

• Injuries occurred significantly more often in competition than practice across all sports.

• 153 (34.7 %) injuries were recurrent.

• The majority of shoulder instability was caused by contact with another player (311/445, 69.9%).
## Results

### TABLE 1: Shoulder Instability Injury Rates (per 100,000 Athlete-Exposures) in Male Contact Athletes by Sport 2009-10 to 2013-14

<table>
<thead>
<tr>
<th>Sport</th>
<th>Shoulder Instability Injuries, n</th>
<th>Injury Rate per 100,000 Athlete-Exposures</th>
<th>Injury Proportion Ratio</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overall</td>
<td>Competition</td>
<td>Practice</td>
<td>Overall</td>
<td>Rate</td>
<td>95% CI</td>
<td>Competition</td>
<td>Rate</td>
<td>95% CI</td>
<td>Practice</td>
<td>Rate</td>
<td>95% CI</td>
</tr>
<tr>
<td>Wrestling</td>
<td>28</td>
<td>7</td>
<td>21</td>
<td>35.56</td>
<td>[22.39, 48.74]</td>
<td>122.82 [99.55, 146.09]</td>
<td>25.74 [22.25, 29.22]</td>
<td>4.77 [3.78, 6.02]*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacrosse</td>
<td>20</td>
<td>9</td>
<td>11</td>
<td>12.46</td>
<td>[7.00, 17.93]</td>
<td>84.39 [21.87, 146.90]</td>
<td>29.81 [17.06, 42.57]</td>
<td>2.83 [1.20, 6.66]*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CI, confidence interval

* sorted in descending order according to overall injury rate

* significant difference between competition and practice injury rates, as determined by exclusion of 1 from 95% CI
Results

- Anterior subluxation was the most common shoulder instability injury (157/445, 35.3%).

- 29.3% of injuries required surgery.
  - Hill-Sachs lesions (2/3, 66.7%) and non-SLAP glenoid labrum tears (33/53, 62.3%) were most likely to require surgery.

- Average time lost (TL) was 8.17 days.
  - Shoulder dislocation had the longest average TL – 17.58 days.
**Results**

Table 2: Shoulder Instability Injury Types Stratified by Sport

<table>
<thead>
<tr>
<th>Sport</th>
<th>Subluxation</th>
<th>Dislocation</th>
<th>Strain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anterior</td>
<td>Posterior</td>
<td>Multi-Directional</td>
</tr>
<tr>
<td></td>
<td>Subluxation</td>
<td>Subluxation</td>
<td>Instability</td>
</tr>
<tr>
<td>Football</td>
<td>107 (33.9%)</td>
<td>59 (18.7%)</td>
<td>25 (7.9%)</td>
</tr>
<tr>
<td>Ice Hockey</td>
<td>33 (40.7%)</td>
<td>11 (13.6%)</td>
<td>4 (4.9%)</td>
</tr>
<tr>
<td>Wrestling</td>
<td>8 (28.6%)</td>
<td>3 (10.7%)</td>
<td>1 (3.6%)</td>
</tr>
<tr>
<td>Lacrosse</td>
<td>9 (45.0%)</td>
<td>2 (10.0%)</td>
<td>1 (5.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>157 (35.3%)</td>
<td>75 (16.9%)</td>
<td>31 (7.0%)</td>
</tr>
</tbody>
</table>

*sorted in descending order according to total injuries*
Results

Differences in average TL, surgery rates, and injury recurrence were observed between Divisions I, II, and III.

| TABLE 3: Divisional Comparison of Average Time Lost, Surgery Rates, and Percent Recurrent Injuries |
|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| **Division I** | **Division II** | **Division III** | **p-value** |
| Average TL (Days) | 4.77 | 20.52 | 11.23 | 0.01* |
| Surgery Rates (Percent) | 32.9% (79/240) | 38.1% (16/42) | 19.4% (24/124) | 0.04* |
| Injury Recurrence (Percent) | 30.7% (83/270) | 33.3% (15/45) | 42.3% (55/127) | 0.07 |

TL, Time Lost
* significant difference at p<0.05
Conclusion

- Wrestling and football were the most likely collegiate contact sports to sustain a shoulder instability injury.

- Anterior subluxation and dislocation accounted for 52.1% of all shoulder instability.

- Player contact was the most common mechanism of injury.

- Surgery rates and TL were significantly different between divisions, which may be due to differential funding and medical coverage.
References


