

## **CONVENIENCE SAMPLE SUMMARY REPORT**

### **NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY**

**2011-2012 School Year**

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## **Note**

The analyses presented here provide only a brief summary of collected data, with the feasibility of a more detailed presentation limited by the extensive breadth and detail contained in the dataset. The principal investigator, Dr. R. Dawn Comstock, is happy to provide further information or to discuss research partnership opportunities upon request.

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## **I. Introduction & Methodology**

## **1.1 Project Overview**

To combat the epidemic of obesity among youth in the United States (US), adolescents must be encouraged to get up off the couch and participate in physically active sports, recreation, and leisure activities. Participation in high school sports, one of the most popular physical activities among adolescents, has grown rapidly from an estimated 4.0 million participants in 1971-72 to an estimated 7.7 million in 2011-12. While the health benefits of a physically active lifestyle including participating in sports are undeniable, high school athletes are at risk of sports-related injury because a certain endemic level of injury can be expected among participants of any physical activity. The challenge to injury epidemiologists is to reduce injury rates among high school athletes to the lowest possible level without discouraging adolescents from engaging in this important form of physical activity. This goal can best be accomplished by investigating the etiology of preventable injuries; by developing, implementing, and evaluating protective interventions using such science-based evidence; and by responsibly reporting epidemiologic findings while promoting a physically active lifestyle among adolescents.

## **1.2 Background and Significance**

High school sports play an important role in the adoption and maintenance of a physically active lifestyle among millions of US adolescents. Too often injury prevention in this population is overlooked as sports-related injuries are thought to be unavoidable. In reality, sports-related injuries are largely preventable through the application of preventive interventions based on evidence-based science. The morbidity, mortality, and disability caused by high school sports-related injuries can be reduced through the development of effective prevention strategies and through programmatic decisions based on injury prevention. However, such efforts rely upon

accurate national estimates of injury incidence, injury rate calculations, and risk and protective factor data. Previously, no injury surveillance system capable of providing researchers with the needed quality of injury and exposure data for high school sports-related injuries existed.

Since the 2008-09 school year, Dr. R. Dawn Comstock has conducted the National High School Sports-Related Injury Surveillance System to monitor injuries among US high school athletes participating in boys' football, boys' and girls' soccer, boys' and girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, girls' softball, girls' field hockey, girls' gymnastics, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field and cheerleading. This surveillance has been conducted using the time- and cost-efficient RIO<sup>TM</sup> (Reporting Information One) surveillance system. This study during the 2011-12 academic year was funded by the Centers for Disease Control and Prevention and the National Federation of State High School Associations (NFHS).

### **1.3 Specific Aims**

The continuing objectives of this study are to continue the National High School Sports-Related Injury Surveillance System among a nationally representative sample of US high schools. The specific aims of this study are:

- A) To determine the incidence (number) of injuries among US high school boys' football, boys' and girls' soccer, boys' and girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, girls' softball, girls' field hockey, girls' gymnastics, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field and cheerleading athletes.

- B) To calculate the rate of injuries per 1,000 athlete-competitions, per 1,000 athlete-practices, and per 1,000 athlete-exposures for US high school athletes in the 18 sports of interest.
- C) To provide detailed information about the injuries sustained by US high school athletes including the type, site, severity, initial and subsequent treatment/care, outcome, etc.
- D) To provide detailed information about the injury events including athlete demographics, position played, phase of play/activity, etc.
- E) To identify potential risk or protective factors.

#### **1.4 Project Design**

The National High School Sports-Related Injury Surveillance System defined an injury as:

- A) An injury that occurred as a result of participation in an organized high school competition, practice, or performance and
- B) Required medical attention by a team physician, certified athletic trainer, personal physician, or emergency department/urgent care facility and
- C) Resulted in restriction of the high school athlete's participation for one or more days beyond the day of injury and
- D) Any fracture, concussion, or dental injury regardless of whether or not it resulted in restriction of the student-athlete's participation.

An athlete exposure was defined as one athlete participating in one practice, competition or performance where he or she is exposed to the possibility of athletic injury. Exposure was expressed in three parts:

- A) Number of athlete-practices = the sum of the number of athletes at each practice during the past week. For example, if 20 athletes practiced on Monday through Thursday and 18 practiced on Friday, the number of athlete-practices would equal 98.
- B) Number of athlete-competitions = the sum of the number of athletes at each competition during the past week. For example, if 9 athletes played in a Freshman game, 12 in a JV game, and 14 in a Varsity game, the number of athlete-competitions would equal 35.
- C) Number of athlete-performances = the sum of the number of cheerleading athletes at each performance during the past week. For example, if 9 cheerleading athletes performed 3 times in one weekend, the number of athlete-performances would equal 27.

### **1.5 Sample Recruitment**

The National Athletic Trainers' Association (NATA) membership list was used to identify eligible reporters - certified athletic trainers (AT) who provide care for high school athletes and who have a valid e-mail address. Each eligible reporter received an e-mail introducing the study and inviting them to participate. A three stage sampling methodology was used to select study schools from all schools with ATs who expressed an interest in participating as reporters.

- 1) All schools were categorized into 8 sampling strata by geographic location (northeast, Midwest, south, and west) and high school size (enrollment  $\leq 1,000$  or  $> 1,000$  students). Participant schools were then randomly selected from each substrata to obtain 100 study schools to report for each of the 9 sports included in the original National High School Sports-Related Injury Surveillance Study (boys' football, soccer, basketball, wrestling, and baseball and girls' soccer, volleyball, basketball, and softball). This subset of 100 study schools were the randomly selected, nationally representative sample.

- 2) All schools not selected in step 1 who offered any of the more rarely offered 9 sports included in the expansion of the National High School Sports-Related Injury Surveillance Study (girls' gymnastics, field hockey, and lacrosse and boys' ice hockey, volleyball and lacrosse) were selected for the convenience sample in an attempt to obtain as large a sample as possible reporting for these more rarely offered sports.
- 3) A random sample of all schools not selected in step 1 or step 2 who offered the remaining of the 9 sports of interest in the expansion of the National High School Sports-Related Injury Surveillance Study (boys' and girls' track & field, swimming & diving and cheerleading) were selected in an attempt to ensure at least 100 schools were reporting for each of the 20 sports of interest.

This three step sampling methodology resulted in a large, nationally disperse convenience sample of US high schools. Participating ATs were offered a \$300-\$400 honorarium depending on the number of sports reported along with individualized injury reports following the study's conclusion.

As a result of the convenience sample methodology, different schools reported for the different sports of interest. See table below:

**School Participation by Sport, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year.\***

|                            | # Schools in<br>Random Sample | # Schools in<br>Convenience Sample | # Schools Total |
|----------------------------|-------------------------------|------------------------------------|-----------------|
| <b>Original Sports</b>     |                               |                                    |                 |
| Football                   | 82                            | 28                                 | 110             |
| Boys' Soccer               | 80                            | 41                                 | 121             |
| Girls' Soccer              | 78                            | 40                                 | 118             |
| Girls' Volleyball          | 83                            | 51                                 | 134             |
| Boys' Basketball           | 91                            | 55                                 | 146             |
| Girls' Basketball          | 90                            | 51                                 | 141             |
| Wrestling                  | 78                            | 53                                 | 131             |
| Baseball                   | 83                            | 47                                 | 130             |
| Softball                   | 85                            | 51                                 | 136             |
| <b>New Sports</b>          |                               |                                    |                 |
| Boys' Volleyball           | 6                             | 9                                  | 15              |
| Field Hockey               | 24                            | 23                                 | 47              |
| Gymnastics                 | 8                             | 14                                 | 22              |
| Ice Hockey                 | 12                            | 11                                 | 23              |
| Boys' Lacrosse             | 19                            | 24                                 | 43              |
| Girls' Lacrosse            | 18                            | 25                                 | 43              |
| Boys' Swimming and Diving  | 22                            | 26                                 | 48              |
| Girls' Swimming and Diving | 20                            | 29                                 | 49              |
| Boys' Track and Field      | 44                            | 57                                 | 101             |
| Girls' Track and Field     | 39                            | 62                                 | 101             |
| Cheerleading               | 29                            | 41                                 | 70              |
| <b>Total</b>               | <b>96</b>                     | <b>78</b>                          | <b>174</b>      |

\*Numbers only include schools who actually reported data for the 2011-12 school year.

## 1.6 Data Collection

Each AT that enrolled their school in National High School Sports-Related Injury Surveillance System received an email every Monday throughout the study period reminding them to enter their school's data into the surveillance system. Each participating AT was asked to complete 45 weekly exposure reports: one for each week from August 1, 2011 through June 10, 2012. Exposure reports collected exposure information (number of athlete-competitions and athlete-practices) and the number of reportable injuries sustained by student athletes of each

sport that was currently in session at their school. For each reportable injury, the AT was asked to complete an injury report. The injury report collected detailed information about the injured player (e.g., age, year in school, etc.), the injury (e.g. site, type, severity, etc.) and the injury event (e.g., position played, phase of play, etc.). This internet-based surveillance tool provided ATs with the ability to view all their submitted data throughout the study and update reports as needed (e.g., need for surgery, days till resuming play, etc.).

### **1.7 Data Management**

In an effort to decrease loss-to follow up, a log of reporters' utilization of the internet-based injury surveillance system was maintained throughout the study period. Reporters who repeatedly failed to log on to complete the weekly exposure and injury reports or who had errors with their reporting were contacted by the study staff and either reminded to report, asked to correct errors, or assessed for their willingness to continue participating in the study.

### **1.8 Data Analysis**

Data were analyzed using SAS software, version 9.3 and SPSS, version 19.0. Although fractures, concussions, and dental injuries resulting in <1 day time loss were collected, unless otherwise noted, analyses in this report excluded these injuries.

Injury rates were calculated as the ratio of unweighted case counts per 1,000 athlete-exposures, and they were compared using rate ratios (RR) with 95% confidence intervals (CI). Following is an example of the RR calculation comparing the rate of injury in boys' soccer to the rate of injury in girls' soccer:

$$RR = \frac{\text{\# boys' soccer injuries} / \text{total \# boys' soccer athlete-exposures}}{\text{\# girls' soccer injuries} / \text{total \# girls' soccer athlete-exposures}}$$

Injury proportions were compared using injury proportion ratios (IPR) and corresponding confidence intervals. Following is an example of the IPR calculation comparing the proportion of male soccer concussions to the proportion of female soccer concussions:

$$IPR = \frac{\text{\# boys' soccer concussions} / \text{total \# boys' soccer injuries}}{\text{\# girls' soccer concussions} / \text{total \# girls' soccer injuries}}$$

An RR or IPR >1.00 suggests a risk association while an RR or IPR <1.00 suggests a protective association. CI not including 1.00 were considered statistically significant

## **II. Overall Injury Epidemiology**

**Table 2.1 Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                         | # Injuries   | # Exposures      | Injury rate<br>(per 1,000 AEs) |
|-------------------------|--------------|------------------|--------------------------------|
| <b>Overall total</b>    | <b>6,213</b> | <b>3,446,539</b> | <b>1.80</b>                    |
| <b>Competition</b>      | <b>3,157</b> | <b>866,206</b>   | <b>3.64</b>                    |
| <b>Practice</b>         | <b>3,041</b> | <b>2,547,542</b> | <b>1.19</b>                    |
| <b>Performance</b>      | <b>15</b>    | <b>32,791</b>    | <b>0.46</b>                    |
| Boys' football total    | 2,372        | 648,392          | 3.66                           |
| Competition             | 1,240        | 104,795          | 11.83                          |
| Practice                | 1,132        | 543,597          | 2.08                           |
| Boys' soccer total      | 408          | 237,983          | 1.71                           |
| Competition             | 255          | 69,427           | 3.67                           |
| Practice                | 153          | 168,556          | 0.91                           |
| Girls' soccer total     | 481          | 195,223          | 2.46                           |
| Competition             | 316          | 57,920           | 5.46                           |
| Practice                | 165          | 137,303          | 1.20                           |
| Boys' volleyball total  | 11           | 20,840           | 0.53                           |
| Competition             | 8            | 7,470            | 1.07                           |
| Practice                | 3            | 13,370           | 0.22                           |
| Girls' volleyball total | 262          | 244,409          | 1.07                           |
| Competition             | 112          | 81,701           | 1.37                           |
| Practice                | 150          | 162,708          | 0.92                           |
| Boys' basketball total  | 410          | 298,304          | 1.37                           |
| Competition             | 225          | 87,673           | 2.57                           |
| Practice                | 185          | 210,631          | 0.88                           |
| Girls' basketball total | 423          | 237,140          | 1.78                           |
| Competition             | 245          | 69,877           | 3.51                           |
| Practice                | 178          | 167,263          | 1.06                           |
| Boys' wrestling total   | 475          | 214,710          | 2.21                           |
| Competition             | 189          | 56,794           | 3.33                           |
| Practice                | 286          | 157,916          | 1.81                           |
| Boys' baseball total    | 182          | 210,329          | 0.87                           |
| Competition             | 95           | 75,256           | 1.26                           |
| Practice                | 87           | 135,073          | 0.64                           |
| Girls' softball total   | 239          | 153,672          | 1.56                           |
| Competition             | 123          | 53,533           | 2.30                           |
| Practice                | 116          | 100,139          | 1.16                           |

**Table 2.1 (Continued) Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                           | # Injuries | # Exposures | Injury rate<br>(per 1,000 AEs) |
|---------------------------|------------|-------------|--------------------------------|
| Girls' Field Hockey total | 134        | 75,740      | 1.77                           |
| Competition               | 58         | 23,169      | 2.50                           |
| Practice                  | 76         | 52,571      | 1.45                           |
| Girls' Gymnastics total   | 21         | 19,246      | 1.09                           |
| Competition               | 6          | 3,278       | 1.83                           |
| Practice                  | 15         | 15,968      | 0.94                           |
| Boys' Ice Hockey total    | 67         | 32,991      | 2.03                           |
| Competition               | 48         | 11,474      | 4.18                           |
| Practice                  | 19         | 21,517      | 0.88                           |
| Boys' Lacrosse total      | 178        | 76,925      | 2.31                           |
| Competition               | 105        | 24,276      | 4.33                           |
| Practice                  | 73         | 52,649      | 1.39                           |
| Girls' Lacrosse total     | 68         | 55,175      | 1.23                           |
| Competition               | 27         | 17,453      | 1.55                           |
| Practice                  | 41         | 37,722      | 1.09                           |
| Boys' Swimming total      | 12         | 63,883      | 0.17                           |
| Competition               | 1          | 12,231      | 0.08                           |
| Practice                  | 11         | 51,652      | 0.21                           |
| Girls' Swimming total     | 28         | 73,788      | 0.38                           |
| Competition               | 2          | 13,841      | 0.14                           |
| Practice                  | 26         | 59,947      | 0.43                           |
| Boys' Track total         | 165        | 221,672     | 0.74                           |
| Competition               | 52         | 44,889      | 1.16                           |
| Practice                  | 113        | 176,783     | 0.64                           |
| Girls' Track total        | 179        | 193,123     | 0.93                           |
| Competition               | 42         | 39,193      | 1.07                           |
| Practice                  | 137        | 153,930     | 0.89                           |
| Cheerleading total        | 98         | 172,994     | 0.57                           |
| Competition               | 8          | 11,956      | 0.67                           |
| Practice                  | 75         | 128,247     | 0.58                           |
| Performance               | 15         | 32,791      | 0.46                           |

\*Only includes injuries resulting in  $\geq 1$  days' time loss.

**Table 2.2 Proportion of Injuries Resulting in Time Loss, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                     | <b>≥1 day time loss</b> | <b>&lt;1 day time loss</b> | <b>Total</b> |
|---------------------|-------------------------|----------------------------|--------------|
| <b>Overall</b>      | <b>99.0%</b>            | <b>1.0%</b>                | <b>100%</b>  |
| Boys' football      | 99.0%                   | 1.0%                       | <b>100%</b>  |
| Boys' soccer        | 98.4%                   | 1.6%                       | <b>100%</b>  |
| Girls' soccer       | 99.2%                   | 0.8%                       | <b>100%</b>  |
| Boys' volleyball    | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Girls' volleyball   | 99.6%                   | 0.4%                       | <b>100%</b>  |
| Boys' basketball    | 99.5%                   | 0.5%                       | <b>100%</b>  |
| Girls' basketball   | 98.6%                   | 1.4%                       | <b>100%</b>  |
| Boys' wrestling     | 98.8%                   | 1.2%                       | <b>100%</b>  |
| Boys' baseball      | 97.3%                   | 2.7%                       | <b>100%</b>  |
| Girls' softball     | 98.4%                   | 1.6%                       | <b>100%</b>  |
| Girls' field hockey | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Girls' gymnastics   | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Boys' ice hockey    | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Boys' lacrosse      | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Girls' lacrosse     | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Boys' swimming      | 92.3%                   | 7.7%                       | <b>100%</b>  |
| Girls' swimming     | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Boys' track         | 99.4%                   | 0.6%                       | <b>100%</b>  |
| Girls' track        | 100.0%                  | 0.0%                       | <b>100%</b>  |
| Cheerleading        | 100.0%                  | 0.0%                       | <b>100%</b>  |

\*By study definition, non-time loss injuries were fractures, concussions, and dental injuries. Because they accounted for less than 2% of all injuries, they are not included in any other analyses.

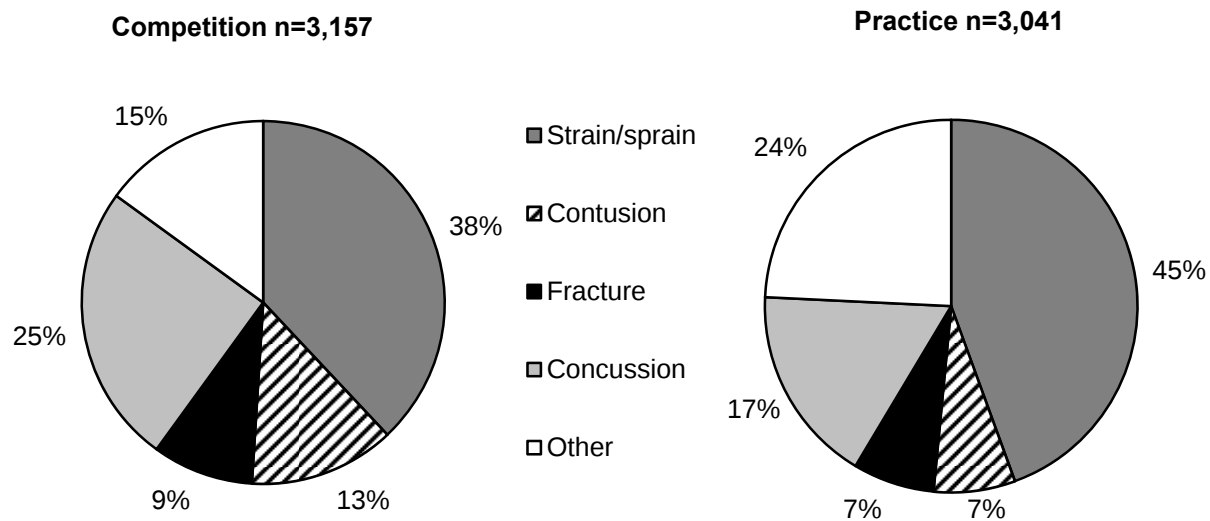
**Table 2.3 Demographic Characteristics of Injured Athletes by Sex, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                       | <b>Male</b>    | <b>Female</b>  |
|-----------------------|----------------|----------------|
| <b>Year in School</b> | <b>n=4,126</b> | <b>n=1,857</b> |
| Freshman              | 22.9%          | 28.2%          |
| Sophomore             | 24.6%          | 28.1%          |
| Junior                | 25.0%          | 23.4%          |
| Senior                | 27.5%          | 20.4%          |
| <b>Total†</b>         | <b>100%</b>    | <b>100%</b>    |
| <b>Age (years)</b>    |                |                |
| Minimum               | 13             | 12             |
| Maximum               | 21             | 19             |
| Mean (St. Dev.)       | 15.9 (1.26)    | 15.6 (1.22)    |
| <b>BMI</b>            |                |                |
| Minimum               | 10.6           | 14.0           |
| Maximum               | 58.3           | 40.3           |
| Mean (St. Dev.)       | 24.9 (4.70)    | 22.3 (3.39)    |

\*All analyses in this report present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 2.1 Injury Diagnosis by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition  |             | Practice     |             | Overall*     |             |
|---------------------|--------------|-------------|--------------|-------------|--------------|-------------|
|                     | n            | %           | n            | %           | n            | %           |
| <b>Body Site</b>    |              |             |              |             |              |             |
| Head/face           | 898          | 28.4%       | 613          | 20.2%       | 1,514        | 24.4%       |
| Ankle               | 481          | 15.2%       | 471          | 15.5%       | 953          | 15.3%       |
| Knee                | 461          | 14.6%       | 347          | 11.4%       | 810          | 13.0%       |
| Hip/thigh/upper leg | 250          | 7.9%        | 391          | 12.9%       | 642          | 10.3%       |
| Hand/wrist          | 265          | 8.4%        | 249          | 8.2%        | 516          | 8.3%        |
| Shoulder            | 221          | 7.0%        | 217          | 7.1%        | 439          | 7.1%        |
| Trunk               | 142          | 4.5%        | 197          | 6.5%        | 339          | 5.5%        |
| Lower leg           | 113          | 3.6%        | 198          | 6.5%        | 311          | 5.0%        |
| Arm/elbow           | 126          | 4.0%        | 98           | 3.2%        | 225          | 3.6%        |
| Foot                | 86           | 2.7%        | 125          | 4.1%        | 213          | 3.4%        |
| Neck                | 44           | 1.4%        | 56           | 1.8%        | 101          | 1.6%        |
| Other               | 70           | 2.2%        | 76           | 2.5%        | 147          | 2.4%        |
| <b>Total</b>        | <b>3,157</b> | <b>100%</b> | <b>3,038</b> | <b>100%</b> | <b>6,210</b> | <b>100%</b> |

\*Overall includes cheerleading performance related injuries however performance injuries do not have an individual column due to them totaling less than 1.0% of all injuries.

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                 | Male       |                     | Female     |                     | Total      |                     |
|---------------------------------|------------|---------------------|------------|---------------------|------------|---------------------|
|                                 | n          | % of ankle injuries | n          | % of ankle injuries | n          | % of ankle injuries |
| <b>Ankle Ligament</b>           |            |                     |            |                     |            |                     |
| Anterior talofibular ligament   | 411        | 73.3%               | 291        | 79.9%               | 725        | 76.1%               |
| Calcaneofibular ligament        | 139        | 24.8%               | 101        | 27.7%               | 247        | 25.9%               |
| Anterior tibiofibular ligament  | 103        | 18.4%               | 51         | 14.0%               | 163        | 17.1%               |
| Posterior talofibular ligament  | 63         | 11.2%               | 45         | 12.4%               | 111        | 11.6%               |
| Deltoid ligament                | 54         | 9.6%                | 16         | 4.4%                | 71         | 7.5%                |
| Posterior tibiofibular ligament | 10         | 1.8%                | 14         | 3.8%                | 25         | 2.6%                |
| <b>Total Ankle Injuries</b>     | <b>561</b> |                     | <b>364</b> |                     | <b>953</b> |                     |

\*Multiple responses allowed per injury report.

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                             | Male       |                    | Female     |                    | Total      |                    |
|-----------------------------|------------|--------------------|------------|--------------------|------------|--------------------|
|                             | n          | % of knee injuries | n          | % of knee injuries | n          | % of knee injuries |
| <b>Knee Ligament</b>        |            |                    |            |                    |            |                    |
| Medial collateral ligament  | 162        | 32.3%              | 53         | 18.5%              | 220        | 27.2%              |
| Patella/patellar tendon     | 96         | 19.2%              | 89         | 31.1%              | 192        | 23.7%              |
| Anterior cruciate ligament  | 91         | 18.2%              | 67         | 23.4%              | 163        | 20.1%              |
| Torn cartilage (meniscus)   | 79         | 15.8%              | 55         | 19.2%              | 138        | 17.0%              |
| Lateral collateral ligament | 30         | 6.0%               | 18         | 6.3%               | 49         | 6.0%               |
| Posterior cruciate ligament | 12         | 2.4%               | 5          | 1.7%               | 17         | 2.1%               |
| <b>Total Knee Injuries</b>  | <b>501</b> |                    | <b>286</b> |                    | <b>810</b> |                    |

\*Multiple responses allowed per injury report.

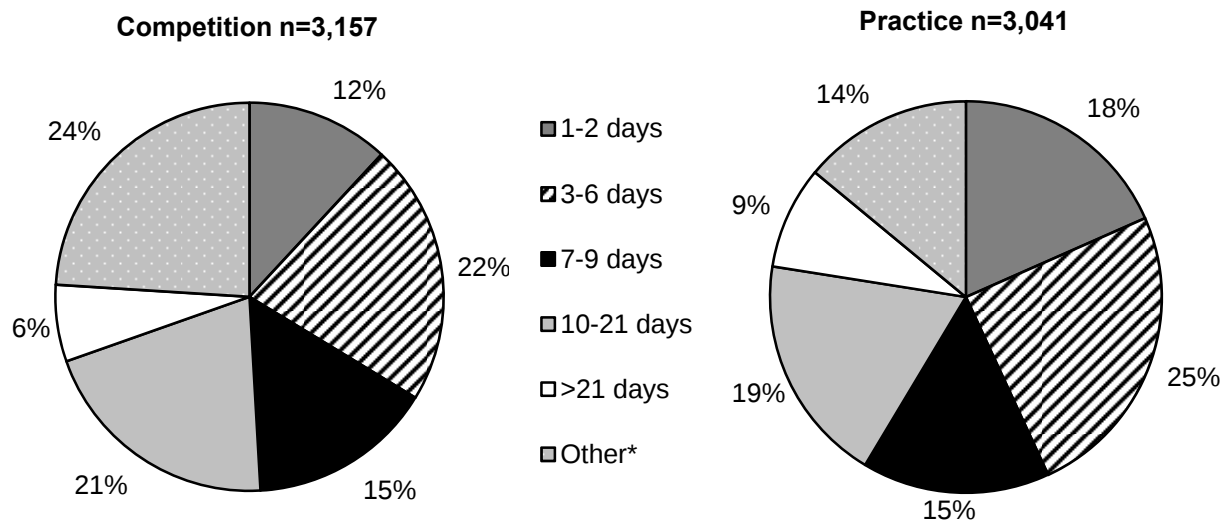
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=3,155 |       | Practice<br>n=3,033 |       | Overall<br>n=6,203 |       |
|-----------------------------------|------------------------|-------|---------------------|-------|--------------------|-------|
|                                   | n                      | %     | n                   | %     | n                  | %     |
| Head/face concussion              | 791                    | 25.1% | 521                 | 17.2% | 1,315              | 21.2% |
| Ankle strain/sprain               | 432                    | 13.7% | 436                 | 14.4% | 869                | 14.0% |
| Hip/thigh/upper leg strain/sprain | 154                    | 4.9%  | 325                 | 10.7% | 480                | 7.7%  |
| Knee strain/sprain                | 264                    | 8.4%  | 153                 | 5.0%  | 418                | 6.7%  |
| Knee other                        | 126                    | 4.0%  | 154                 | 5.1%  | 281                | 4.5%  |
| Hand/wrist fracture               | 120                    | 3.8%  | 106                 | 3.5%  | 228                | 3.7%  |
| Shoulder other                    | 98                     | 3.1%  | 112                 | 3.7%  | 211                | 3.4%  |
| Shoulder strain/sprain            | 96                     | 3.0%  | 93                  | 3.1%  | 189                | 3.0%  |
| Hand/wrist strain/sprain          | 86                     | 2.7%  | 82                  | 2.7%  | 168                | 2.7%  |
| Trunk strain/sprain               | 48                     | 1.5%  | 91                  | 3.0%  | 139                | 2.2%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



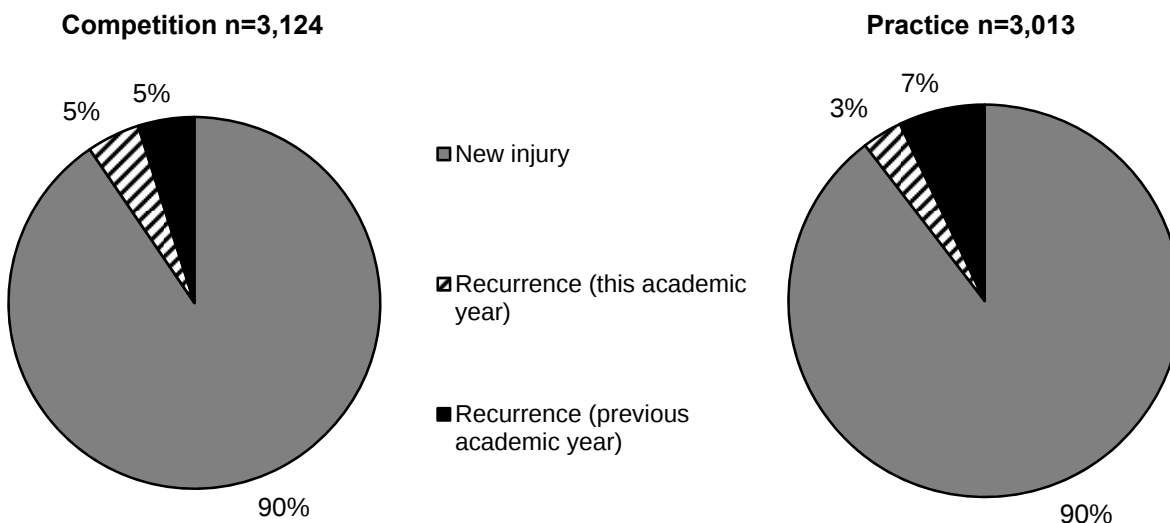
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 2.8 Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition  |             | Practice     |             | Overall      |             |
|-------------------------|--------------|-------------|--------------|-------------|--------------|-------------|
|                         | n            | %           | n            | %           | n            | %           |
| <b>Need for surgery</b> |              |             |              |             |              |             |
| Required surgery        | 233          | 7.5         | 160          | 5.3         | 393          | 6.4%        |
| Did not require surgery | 2,872        | 92.5        | 2,835        | 94.7        | 5,722        | 93.6%       |
| <b>Total</b>            | <b>3,105</b> | <b>100%</b> | <b>2,995</b> | <b>100%</b> | <b>6,115</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n            | %           |
|-----------------------|--------------|-------------|
| <b>Time in Season</b> |              |             |
| Preseason             | 1,420        | 22.9%       |
| Regular season        | 4,510        | 72.9%       |
| Post season           | 259          | 4.2%        |
| <b>Total</b>          | <b>6,189</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n            | %           |
|-------------------------|--------------|-------------|
| <b>Time in Practice</b> |              |             |
| First ½ hour            | 324          | 11.6%       |
| Second ½ hour           | 559          | 20.0%       |
| 1-2 hours into practice | 1,603        | 57.4%       |
| > 2 hours into practice | 309          | 11.1%       |
| <b>Total</b>            | <b>2,795</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                     | n            | %           |
|-------------------------------------|--------------|-------------|
| <b>% of Injuries Evaluated by:*</b> |              |             |
| Certified athletic trainer          | 5,776        | 93.0%       |
| General physician                   | 2,153        | 34.7%       |
| Orthopedic physician                | 1,976        | 31.8%       |
| Chiropractor                        | 67           | 1.1%        |
| Physician's assistant               | 65           | 1.0%        |
| Nurse practitioner                  | 31           | 0.5%        |
| Neurologist                         | 146          | 2.3%        |
| Dentist/oral surgeon                | 15           | 0.5%        |
| Other                               | 185          | 3.0%        |
| <b>Total</b>                        | <b>6,213</b> | <b>100%</b> |
| <b>% of Injuries Assessed by:*</b>  |              |             |
| Evaluation                          | 6,091        | 98.0%       |
| X-ray                               | 2,143        | 34.5%       |
| MRI                                 | 633          | 10.2%       |
| CT-scan                             | 290          | 4.7%        |
| Surgery                             | 76           | 1.2%        |
| Blood work/lab test                 | 59           | 0.9%        |
| Other                               | 43           | 0.7%        |
| <b>Total</b>                        | <b>6,213</b> | <b>100%</b> |

\*Multiple responses allowed per injury report.

†Totals and n's are not always equal due to slight rounding or missing responses.

### **III. Boys' Football Injury Epidemiology**

**Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries   | # Exposures    | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|--------------|----------------|----------------------------------------------|
| <b>Total</b> | <b>2,372</b> | <b>648,392</b> | <b>3.66</b>                                  |
| Competition  | 1,240        | 104,795        | 11.83                                        |
| Practice     | 1,132        | 543,597        | 2.08                                         |

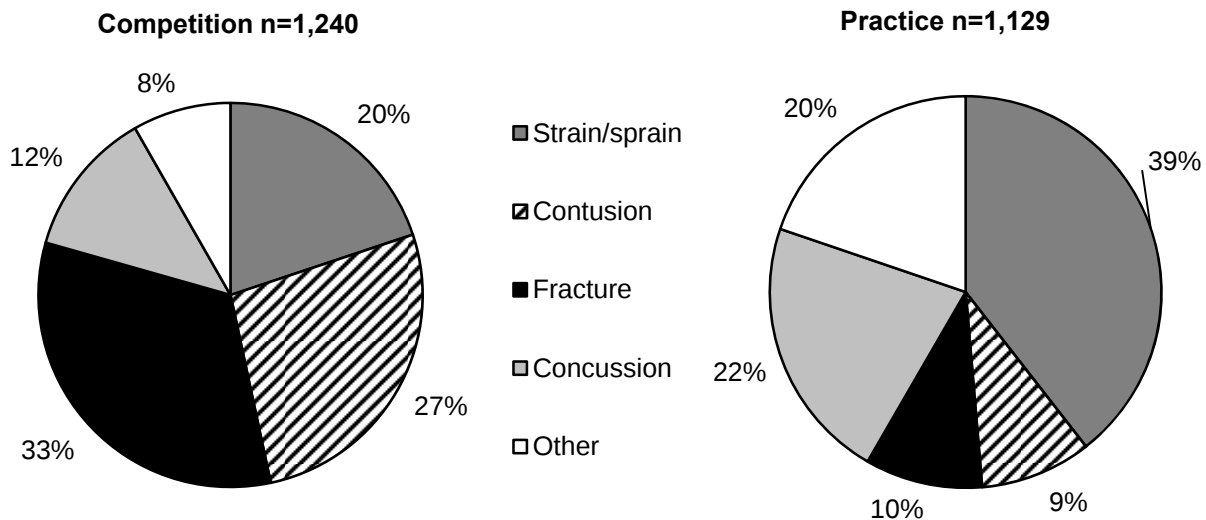
**Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |                |
|--------------------------|----------------|
| <b>Year in School</b>    | <b>n=2,345</b> |
| Freshman                 | 23.8%          |
| Sophomore                | 24.4%          |
| Junior                   | 23.7%          |
| Senior                   | 28.1%          |
| <b>Total<sup>†</sup></b> | <b>100%</b>    |
| <b>Age (years)</b>       |                |
| Minimum                  | 13             |
| Maximum                  | 19             |
| Mean (St. Dev.)          | 15.9 (1.25)    |
| <b>BMI</b>               |                |
| Minimum                  | 10.6           |
| Maximum                  | 58.3           |
| Mean (SE)                | 26.2 (5.00)    |

\*All analyses in this report present un-weighted data

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 3.1 Diagnosis of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition  |             | Practice     |             | Overall      |             |
|---------------------|--------------|-------------|--------------|-------------|--------------|-------------|
|                     | n            | %           | n            | %           | n            | %           |
| <b>Body Site</b>    |              |             |              |             |              |             |
| Head/face           | 300          | 24.2%       | 257          | 22.7%       | 557          | 23.5%       |
| Knee                | 188          | 15.2%       | 123          | 10.9%       | 311          | 13.1%       |
| Ankle               | 168          | 13.5%       | 125          | 11.1%       | 293          | 12.4%       |
| Hand/wrist          | 115          | 9.3%        | 125          | 11.1%       | 240          | 10.1%       |
| Shoulder            | 136          | 11.0%       | 102          | 9.0%        | 238          | 10.0%       |
| Hip/thigh/upper leg | 79           | 6.4%        | 125          | 11.1%       | 204          | 8.6%        |
| Trunk               | 55           | 4.4%        | 73           | 6.5%        | 128          | 5.4%        |
| Arm/elbow           | 59           | 4.8%        | 41           | 3.6%        | 100          | 4.2%        |
| Lower leg           | 47           | 3.8%        | 44           | 3.9%        | 91           | 3.8%        |
| Foot                | 25           | 2.0%        | 45           | 4.0%        | 70           | 3.0%        |
| Neck                | 29           | 2.3%        | 29           | 2.6%        | 58           | 2.4%        |
| Other               | 39           | 3.1%        | 42           | 3.7%        | 81           | 3.4%        |
| <b>Total</b>        | <b>1,240</b> | <b>100%</b> | <b>1,131</b> | <b>100%</b> | <b>2,371</b> | <b>100%</b> |

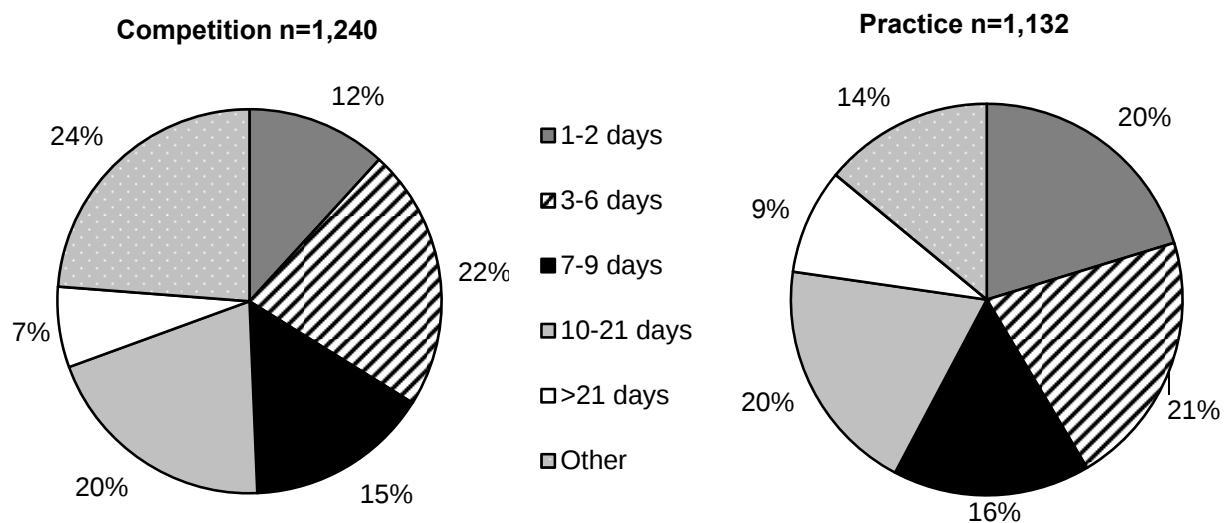
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=1,240 |       | Practice<br>n=1,128 |       | Total<br>n=2,368 |       |
|-----------------------------------|------------------------|-------|---------------------|-------|------------------|-------|
|                                   | n                      | %     | n                   | %     | n                | %     |
| Head/face concussion              | 287                    | 23.1% | 247                 | 21.9% | 534              | 22.6% |
| Ankle strain/sprain               | 146                    | 11.8% | 115                 | 10.2% | 261              | 11.0% |
| Knee strain/sprain                | 126                    | 10.2% | 66                  | 5.9%  | 192              | 8.1%  |
| Hip/thigh/upper leg strain/sprain | 34                     | 2.7%  | 100                 | 8.9%  | 134              | 5.7%  |
| Shoulder other                    | 65                     | 5.2%  | 47                  | 4.2%  | 112              | 4.7%  |
| Hand/wrist fracture               | 56                     | 4.5%  | 53                  | 4.7%  | 109              | 4.6%  |
| Shoulder strain/sprain            | 54                     | 4.4%  | 44                  | 3.9%  | 98               | 4.1%  |
| Knee other                        | 42                     | 3.4%  | 42                  | 3.7%  | 84               | 3.5%  |
| Hand/wrist strain/sprain          | 28                     | 2.3%  | 34                  | 3.0%  | 62               | 2.6%  |
| Hip/thigh/upper leg contusion     | 39                     | 3.1%  | 14                  | 1.2%  | 53               | 2.2%  |
| Trunk contusion                   | 21                     | 1.7%  | 21                  | 1.9%  | 42               | 1.8%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



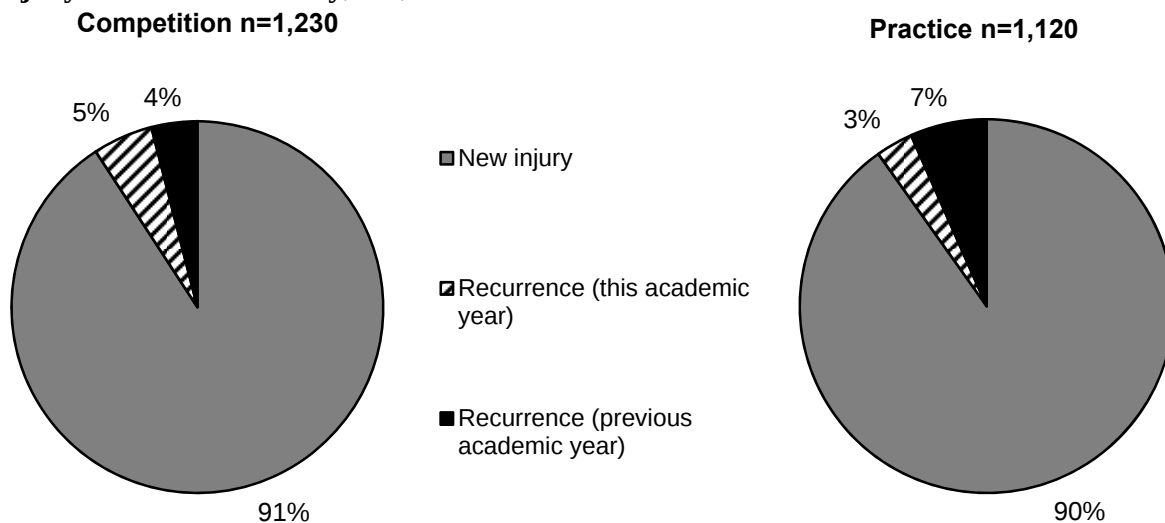
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 3.5 Football Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition  |             | Practice     |             | Overall      |             |
|-------------------------|--------------|-------------|--------------|-------------|--------------|-------------|
|                         | n            | %           | n            | %           | n            | %           |
| <b>Need for surgery</b> |              |             |              |             |              |             |
| Required surgery        | 102          | 8.4%        | 67           | 6.0%        | 169          | 7.2%        |
| Did not require surgery | 1,117        | 91.6%       | 1,050        | 94.0%       | 2,167        | 92.8%       |
| <b>Total</b>            | <b>1,219</b> | <b>100%</b> | <b>1,117</b> | <b>100%</b> | <b>2,336</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n            | %           |
|-----------------------|--------------|-------------|
| <b>Time in Season</b> |              |             |
| Preseason             | 692          | 29.2%       |
| Regular season        | 1,550        | 65.5%       |
| Post season           | 125          | 5.3%        |
| <b>Total</b>          | <b>2,367</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                      | <b>n</b>     | <b>%</b>    |
|--------------------------------------|--------------|-------------|
| <b>Time in Competition</b>           |              |             |
| Pre-competition/warm-ups             | 18           | 1.5%        |
| First quarter                        | 128          | 10.8%       |
| Second quarter                       | 355          | 30.0%       |
| Third quarter                        | 380          | 32.1%       |
| Fourth quarter                       | 301          | 25.4%       |
| Overtime                             | 3            | 0.3%        |
| <b>Total</b>                         | <b>1,185</b> | <b>100%</b> |
| <b>Field Location</b>                |              |             |
| Between the 20 yard lines            | 970          | 82.3%       |
| Red zone (20 yard line to goal line) | 177          | 15.0%       |
| End zone                             | 16           | 1.4%        |
| Off the field                        | 16           | 1.4%        |
| <b>Total</b>                         | <b>1,179</b> | <b>100%</b> |

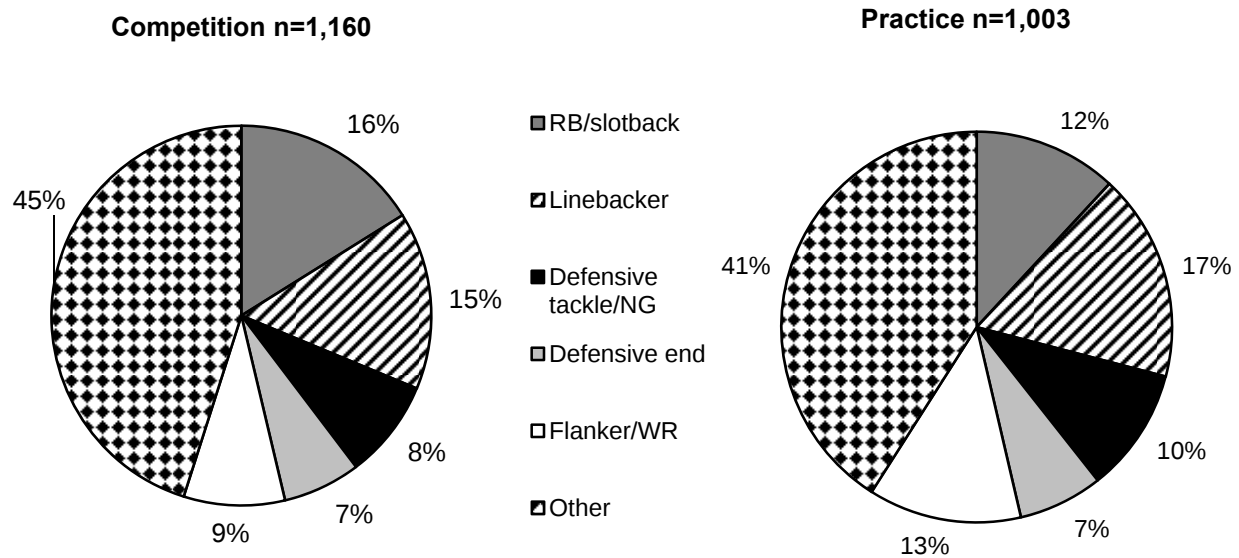
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | <b>n</b>     | <b>%</b>    |
|-------------------------|--------------|-------------|
| <b>Time in Practice</b> |              |             |
| First 1/2 hour          | 81           | 7.7%        |
| Second 1/2 hour         | 187          | 17.8%       |
| 1-2 hours into practice | 630          | 59.9%       |
| >2 hours into practice  | 153          | 14.6%       |
| <b>Total</b>            | <b>1,051</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

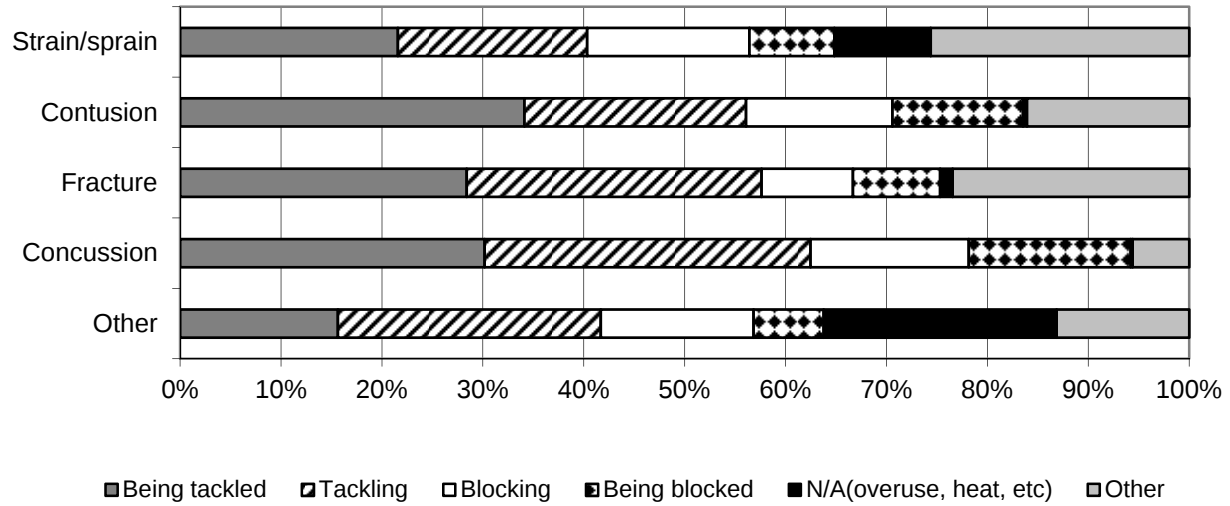


**Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                                 | Competition  |             | Practice     |             | Overall      |             |
|------------------------------------------|--------------|-------------|--------------|-------------|--------------|-------------|
|                                          | n            | %           | n            | %           | n            | %           |
| Tackling                                 | 312          | 25.9%       | 254          | 23.0%       | 566          | 24.5%       |
| Being tackled                            | 363          | 30.1%       | 204          | 18.5%       | 567          | 24.5%       |
| Blocking                                 | 176          | 14.6%       | 169          | 15.3%       | 345          | 14.9%       |
| Being blocked                            | 147          | 12.2%       | 94           | 8.5%        | 241          | 10.2%       |
| N/A (e.g., overuse, heat illness, etc.)  | 25           | 2.1%        | 158          | 14.3%       | 183          | 7.9%        |
| Stepped on/fell on/kicked                | 61           | 5.1%        | 68           | 6.2%        | 129          | 5.6%        |
| Rotation around a planted foot/inversion | 55           | 4.6%        | 48           | 4.3%        | 103          | 4.5%        |
| Uneven playing surface                   | 8            | 0.7%        | 20           | 1.8%        | 28           | 1.2%        |
| Contact with ball                        | 9            | 0.7%        | 11           | 1.0%        | 20           | 0.9%        |
| Contact with blocking sled/dummy         | 1            | 0.1%        | 16           | 1.4%        | 17           | 0.7%        |
| Contact with goal posts/yard marker/etc. | 2            | 0.2%        | 4            | 0.4%        | 6            | 0.3%        |
| Other                                    | 47           | 3.9%        | 59           | 5.3%        | 106          | 4.6%        |
| <b>Total</b>                             | <b>1,206</b> | <b>100%</b> | <b>1,105</b> | <b>100%</b> | <b>2,311</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 3.5 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



#### **IV. Boys' Soccer Injury Epidemiology**

**Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|----------------|----------------------------------------------|
| <b>Total</b> | <b>408</b> | <b>237,983</b> | <b>1.71</b>                                  |
| Competition  | 255        | 69,427         | 3.67                                         |
| Practice     | 153        | 168,556        | 0.91                                         |

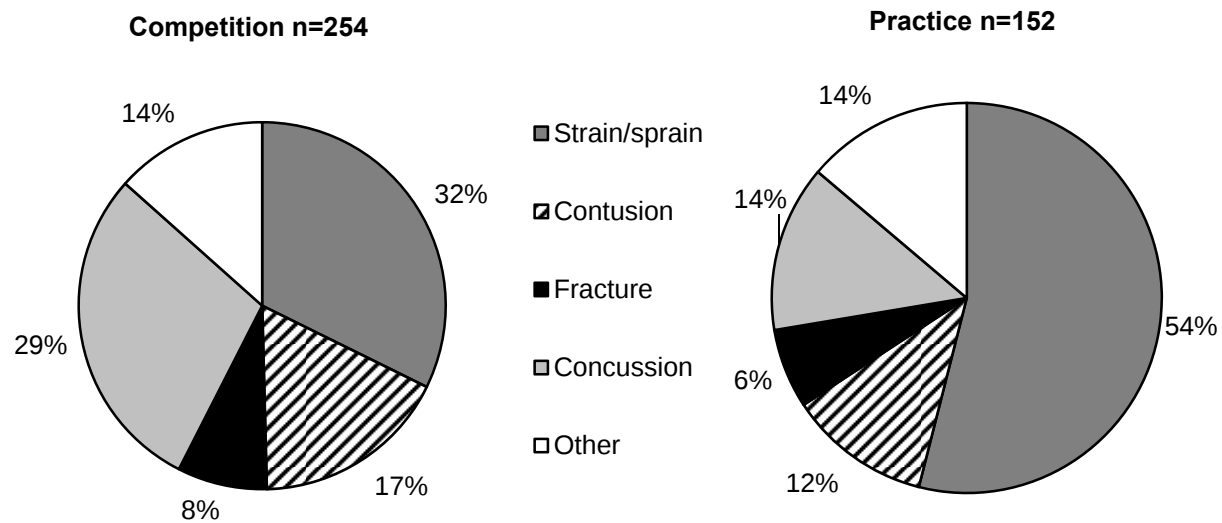
**Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                       |              |
|-----------------------|--------------|
| <b>Year in School</b> | <b>n=404</b> |
| Freshman              | 16.8%        |
| Sophomore             | 21.8%        |
| Junior                | 29.7%        |
| Senior                | 31.7%        |
| <b>Total†</b>         | <b>100%</b>  |
| <b>Age (years)</b>    |              |
| Minimum               | 13           |
| Maximum               | 19           |
| Mean (St. Dev.)       | 16.1 (1.24)  |
| <b>BMI</b>            |              |
| Minimum               | 13.0         |
| Maximum               | 36.4         |
| Mean (St. Dev.)       | 22.6 (3.00)  |

\*All analyses in this report present data un-weighted

†Throughout this report, totals and n's represent the total un-weighted numbers of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 4.1 Diagnosis of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Head/face           | 92          | 36.1%       | 27         | 17.6%       | 119        | 29.2%       |
| Hip/thigh/upper leg | 33          | 12.9%       | 41         | 26.8%       | 74         | 18.1%       |
| Ankle               | 30          | 11.8%       | 23         | 15.0%       | 53         | 13.0%       |
| Knee                | 31          | 12.2%       | 18         | 11.8%       | 49         | 12.0%       |
| Foot                | 22          | 8.6%        | 11         | 7.2%        | 33         | 8.1%        |
| Lower leg           | 14          | 5.5%        | 10         | 6.5%        | 24         | 5.9%        |
| Hand/wrist          | 10          | 3.9%        | 8          | 5.2%        | 18         | 4.4%        |
| Trunk               | 10          | 3.9%        | 7          | 4.6%        | 17         | 4.2%        |
| Shoulder            | 7           | 2.7%        | 2          | 1.3%        | 9          | 2.2%        |
| Arm/elbow           | 2           | 0.8%        | 2          | 1.3%        | 4          | 1.0%        |
| Neck                | 2           | 0.8%        | 1          | 0.7%        | 3          | 0.7%        |
| Other               | 2           | 0.8%        | 3          | 2.0%        | 5          | 1.2%        |
| <b>Total</b>        | <b>255</b>  | <b>100%</b> | <b>153</b> | <b>100%</b> | <b>408</b> | <b>100%</b> |

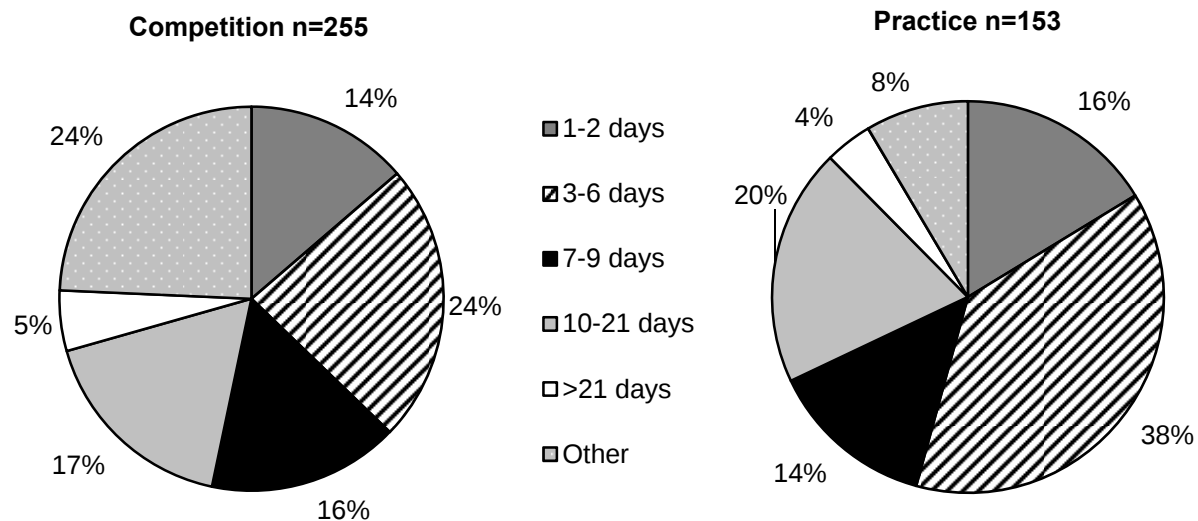
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=254 |       | Practice<br>n=152 |       | Total<br>n=406 |       |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                    | %     | n                 | %     | n              | %     |
| Head/face concussion              | 74                   | 29.1% | 21                | 13.8% | 95             | 23.4% |
| Hip/thigh/upper leg strain/sprain | 20                   | 7.9%  | 35                | 23.0% | 55             | 13.5% |
| Ankle strain/sprain               | 24                   | 9.4%  | 23                | 15.1% | 47             | 11.6% |
| Knee strain/sprain                | 18                   | 7.1%  | 7                 | 4.6%  | 25             | 6.2%  |
| Foot contusion                    | 12                   | 4.7%  | 4                 | 2.6%  | 16             | 3.9%  |
| Knee other                        | 8                    | 3.1%  | 7                 | 4.6%  | 15             | 3.7%  |
| Head/face other                   | 12                   | 4.7%  | 3                 | 2.0%  | 15             | 3.7%  |
| Hand/wrist fracture               | 7                    | 2.8%  | 5                 | 3.3%  | 12             | 3.0%  |
| Foot strain/sprain                | 7                    | 2.8%  | 3                 | 2.0%  | 10             | 2.5%  |
| Trunk strain/sprain               | 2                    | 0.8%  | 5                 | 3.3%  | 7              | 1.7%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



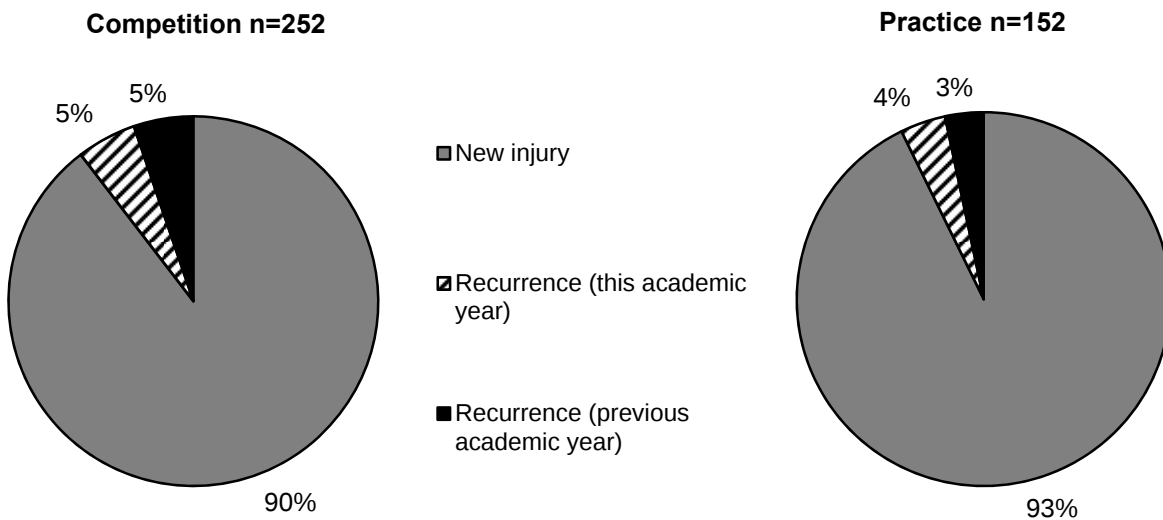
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 4.5 Boys' Soccer Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 15          | 6.0%        | 2          | 1.4%        | 17         | 4.3%        |
| Did not require surgery | 235         | 94.0%       | 146        | 98.6%       | 381        | 95.7%       |
| <b>Total</b>            | <b>250</b>  | <b>100%</b> | <b>148</b> | <b>100%</b> | <b>398</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 74         | 18.2%       |
| Regular season        | 308        | 75.7%       |
| Post season           | 25         | 6.1%        |
| <b>Total</b>          | <b>407</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                   | <b>n</b>   | <b>%</b>    |
|---------------------------------------------------|------------|-------------|
| <b>Time in Competition</b>                        |            |             |
| Pre-competition/warm-ups                          | 11         | 4.6%        |
| First half                                        | 81         | 34.0%       |
| Second half                                       | 144        | 60.5%       |
| Overtime                                          | 2          | 0.8%        |
| <b>Total</b>                                      | <b>238</b> | <b>100%</b> |
| <b>Field Location</b>                             |            |             |
| Top of goal box extended to center line (offense) | 86         | 36.8%       |
| Top of goal box extended to center line (defense) | 42         | 17.9%       |
| Side of goal box (offense)                        | 17         | 7.3%        |
| Goal box (defense)                                | 39         | 16.7%       |
| Goal box (offense)                                | 23         | 9.8%        |
| Side of goal box (defense)                        | 21         | 9.0%        |
| Off the field                                     | 6          | 2.6%        |
| <b>Total</b>                                      | <b>234</b> | <b>100%</b> |

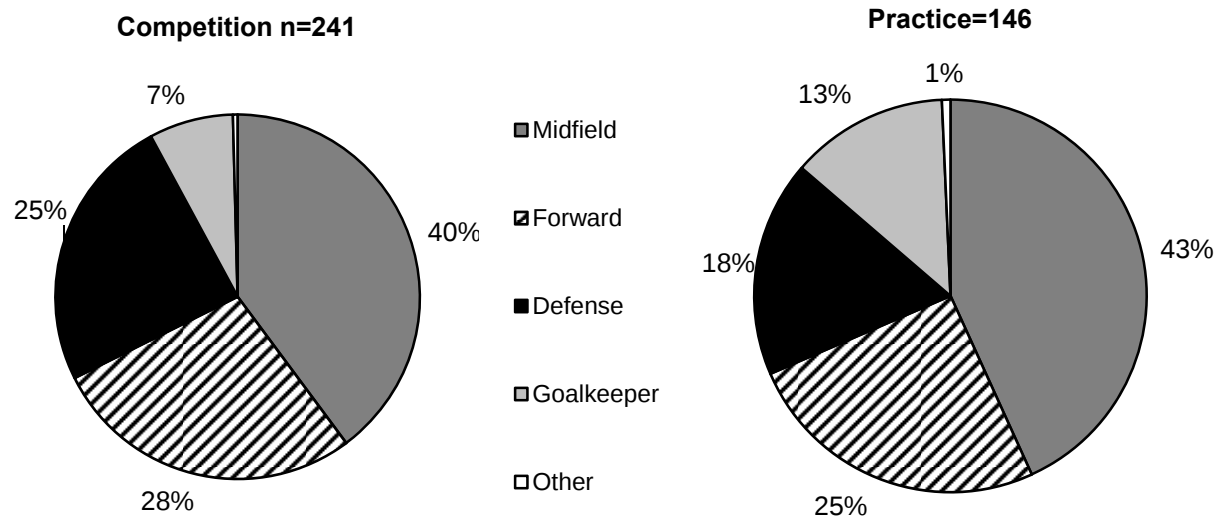
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | <b>n</b>   | <b>%</b>    |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 16         | 11.9%       |
| Second 1/2 hour         | 36         | 26.9%       |
| 1-2 hours into practice | 67         | 50.0%       |
| >2 hours into practice  | 15         | 11.2%       |
| <b>Total</b>            | <b>134</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

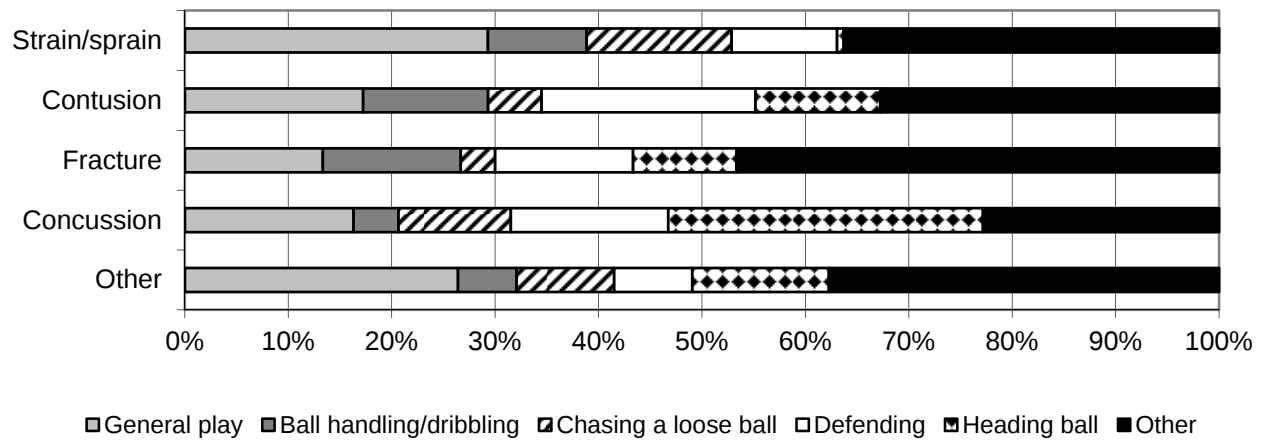


**Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                           | Competition |             | Practice   |             | Overall    |             |
|---------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                           | n           | %           | n          | %           | n          | %           |
| <b>Activity</b>           |             |             |            |             |            |             |
| General play              | 42          | 17.3%       | 47         | 31.5%       | 89         | 22.7%       |
| Defending                 | 38          | 15.6%       | 12         | 8.1%        | 50         | 12.8%       |
| Heading ball              | 35          | 14.4%       | 11         | 7.4%        | 46         | 11.7%       |
| Chasing loose ball        | 28          | 11.5%       | 13         | 8.7%        | 41         | 10.5%       |
| Ball handling/dribbling   | 27          | 11.1%       | 7          | 4.7%        | 34         | 8.7%        |
| Goaltending               | 15          | 6.2%        | 11         | 7.4%        | 26         | 6.6%        |
| Shooting (foot)           | 15          | 6.2%        | 10         | 6.7%        | 25         | 6.4%        |
| Passing (foot)            | 13          | 5.3%        | 7          | 4.7%        | 20         | 5.1%        |
| Conditioning              | 1           | 0.4%        | 18         | 12.1%       | 19         | 4.8%        |
| Receiving pass            | 13          | 5.3%        | 4          | 2.7%        | 17         | 4.3%        |
| Blocking shot             | 6           | 2.5%        | 7          | 4.7%        | 13         | 3.3%        |
| Attempting a slide tackle | 5           | 2.1%        | 1          | 0.7%        | 6          | 1.5%        |
| Receiving a slide tackle  | 1           | 0.4%        | 1          | 0.7%        | 2          | 0.5%        |
| Other                     | 4           | 1.6%        | ---        | 0.0%        | 4          | 1.0%        |
| <b>Total</b>              | <b>243</b>  | <b>100%</b> | <b>149</b> | <b>100%</b> | <b>392</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 4.5 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **V. Girls' Soccer Injury Epidemiology**

**Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>481</b> | <b>195,223</b> | <b>2.46</b>                                      |
| Competition  | 316        | 57,920         | 5.46                                             |
| Practice     | 165        | 137,303        | 1.20                                             |

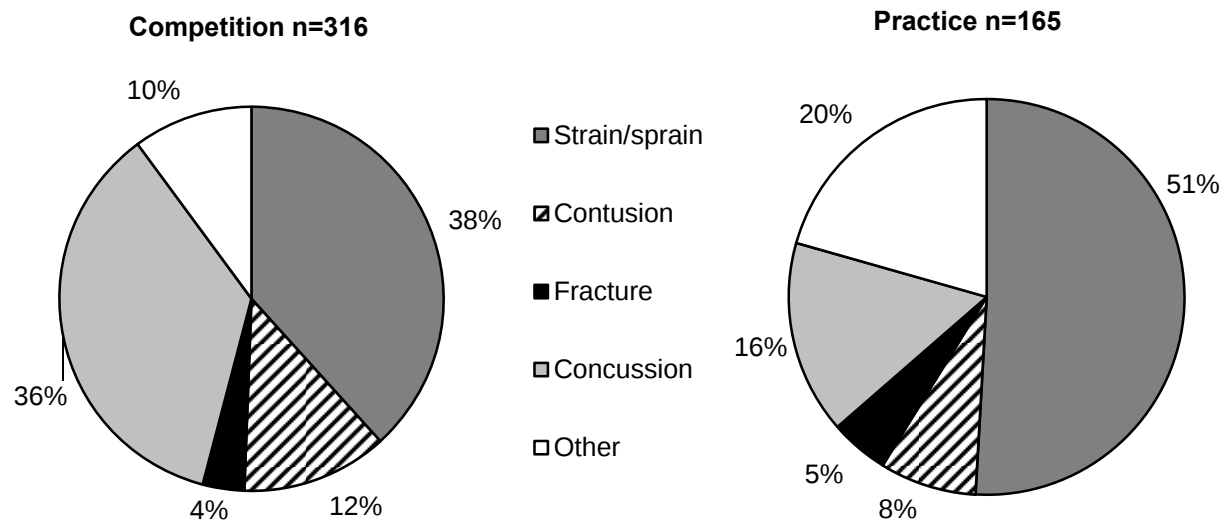
**Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=474</b> |
| Freshman                 | 25.5%        |
| Sophomore                | 27.2%        |
| Junior                   | 26.8%        |
| Senior                   | 20.5%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 12           |
| Maximum                  | 18           |
| Mean (St. Dev.)          | 15.7 (1.2)   |
| <b>BMI</b>               |              |
| Minimum                  | 14.1         |
| Maximum                  | 40.3         |
| Mean (St. Dev.)          | 22.3 (3.5)   |

\*All analyses in this report present un-weighted data

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 5.1 Diagnosis of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Head/face           | 121         | 38.3%       | 27         | 16.4%       | 148        | 30.8%       |
| Ankle               | 58          | 18.4%       | 45         | 27.3%       | 103        | 21.4%       |
| Knee                | 63          | 19.9%       | 21         | 12.7%       | 84         | 17.5%       |
| Hip/thigh/upper leg | 20          | 6.3%        | 28         | 17.0%       | 48         | 10.0%       |
| Lower leg           | 11          | 3.5%        | 18         | 10.9%       | 29         | 6.0%        |
| Foot                | 12          | 3.8%        | 8          | 4.8%        | 20         | 4.2%        |
| Hand/wrist          | 11          | 3.5%        | 5          | 3.0%        | 16         | 3.3%        |
| Trunk               | 8           | 2.5%        | 7          | 4.2%        | 15         | 3.1%        |
| Shoulder            | 4           | 1.3%        | 2          | 1.2%        | 6          | 1.2%        |
| Arm/elbow           | 4           | 1.3%        | 1          | 0.6%        | 5          | 1.0%        |
| Neck                | 2           | 0.6%        | ---        | 0.0%        | 2          | 0.4%        |
| Other               | 2           | 0.6%        | 3          | 1.8%        | 5          | 1.0%        |
| <b>Total</b>        | <b>316</b>  | <b>100%</b> | <b>165</b> | <b>100%</b> | <b>481</b> | <b>100%</b> |

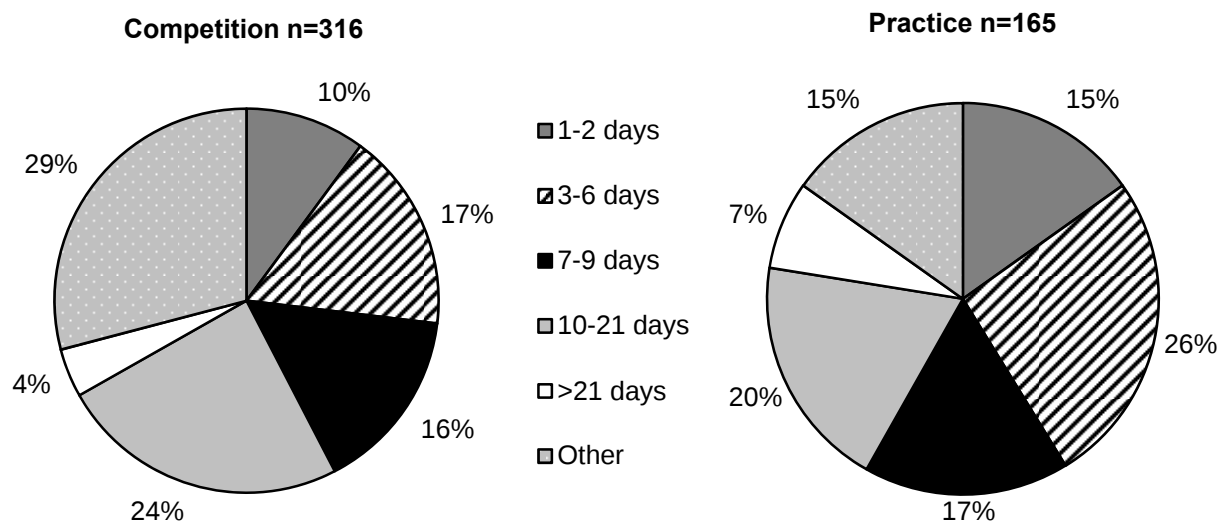
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Competition<br>n=316 |       | Practice<br>n=165 |       | Total<br>n=481 |       |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                    | %     | n                 | %     | n              | %     |
| <b>Diagnosis</b>                  |                      |       |                   |       |                |       |
| Head/face concussion              | 112                  | 35.4% | 26                | 15.8% | 138            | 28.7% |
| Ankle strain/sprain               | 51                   | 16.1% | 40                | 24.2% | 91             | 18.9% |
| Knee strain/sprain                | 43                   | 13.6% | 5                 | 3.0%  | 48             | 10.0% |
| Hip/thigh/upper leg strain/sprain | 16                   | 5.1%  | 26                | 15.8% | 42             | 8.7%  |
| Knee other                        | 11                   | 3.5%  | 10                | 6.1%  | 21             | 4.4%  |
| Lower leg other                   | 3                    | 0.9%  | 12                | 7.3%  | 15             | 3.1%  |
| Knee contusion                    | 9                    | 2.8%  | 6                 | 3.6%  | 15             | 3.1%  |
| Foot contusion                    | 6                    | 1.9%  | 3                 | 1.8%  | 9              | 1.9%  |
| Hand/wrist fracture               | 3                    | 0.9%  | 5                 | 3.0%  | 8              | 1.7%  |
| Lower leg contusions              | 5                    | 1.6%  | 2                 | 1.2%  | 7              | 1.5%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



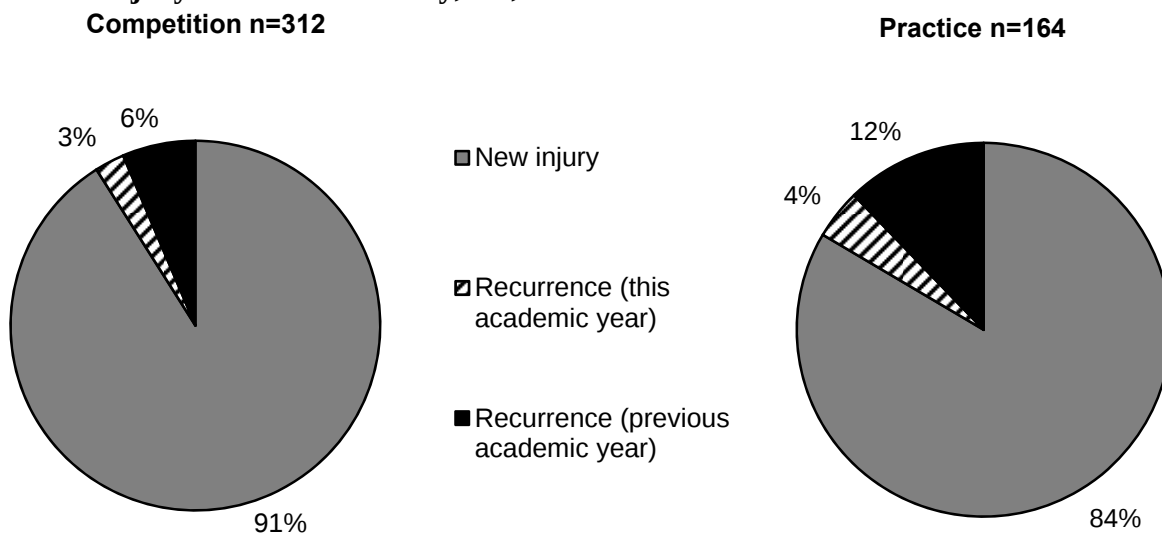
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 5.5 Girls' Soccer Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 25          | 8.0%        | 5          | 3.0%        | 30         | 6.3%        |
| Did not require surgery | 286         | 92.0%       | 159        | 97.0%       | 445        | 93.7%       |
| <b>Total</b>            | <b>311</b>  | <b>100%</b> | <b>164</b> | <b>100%</b> | <b>475</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 83         | 17.3%       |
| Regular season        | 382        | 79.7%       |
| Post season           | 14         | 2.9%        |
| <b>Total</b>          | <b>479</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                   | n          | %           |
|---------------------------------------------------|------------|-------------|
| <b>Time in Competition</b>                        |            |             |
| Pre-competition/warm-ups                          | 3          | 1.0%        |
| First half                                        | 100        | 33.3%       |
| Second half                                       | 195        | 65.0%       |
| Overtime                                          | 2          | 0.7%        |
| <b>Total</b>                                      | <b>300</b> | <b>100%</b> |
| <b>Field Location</b>                             |            |             |
| Top of goal box extended to center line (offense) | 86         | 29.7%       |
| Top of goal box extended to center line (defense) | 68         | 23.4%       |
| Goal box (defense)                                | 49         | 16.9%       |
| Side of goal box (defense)                        | 31         | 10.7%       |
| Side of goal box (offense)                        | 25         | 8.6%        |
| Goal box (offense)                                | 29         | 10.0%       |
| Off the field                                     | 2          | 0.7%        |
| <b>Total</b>                                      | <b>290</b> | <b>100%</b> |

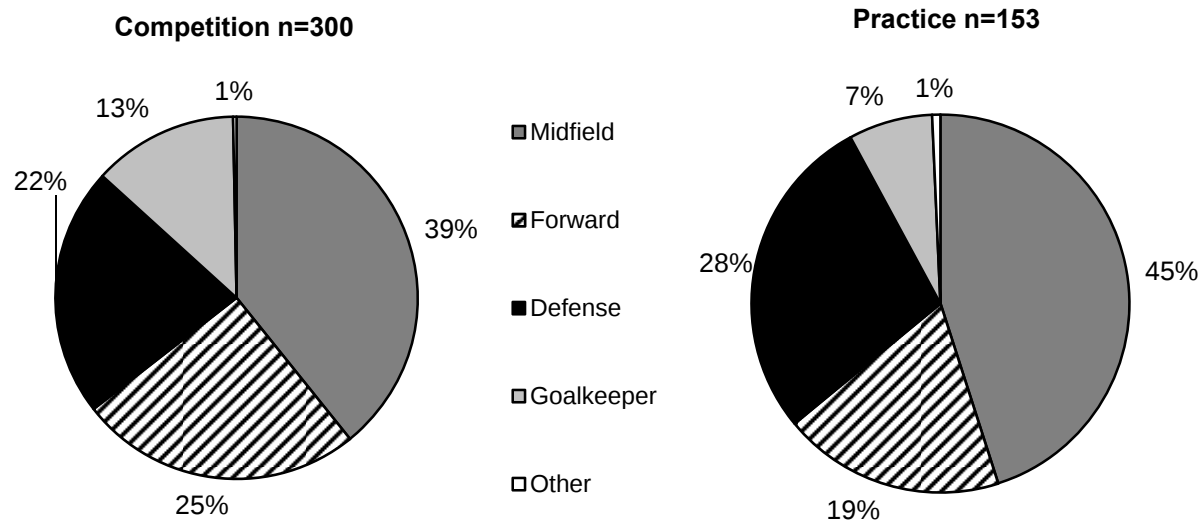
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 26         | 17.1%       |
| Second 1/2 hour         | 30         | 19.7%       |
| 1-2 hours into practice | 87         | 57.2%       |
| >2 hours into practice  | 9          | 5.9%        |
| <b>Total</b>            | <b>152</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

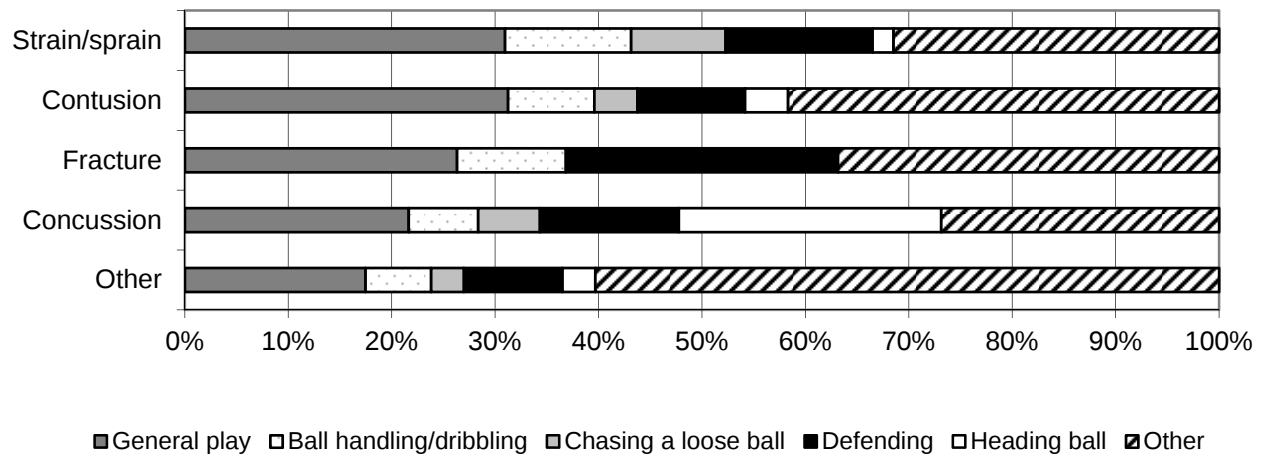


**Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                           | Competition |             | Practice   |             | Overall    |             |
|---------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                           | n           | %           | n          | %           | n          | %           |
| <b>Activity</b>           |             |             |            |             |            |             |
| General play              | 68          | 22.4%       | 63         | 39.9%       | 131        | 28.4%       |
| Defending                 | 43          | 14.2%       | 19         | 12.0%       | 62         | 13.4%       |
| Ball handling/dribbling   | 35          | 11.6%       | 8          | 5.1%        | 43         | 9.3%        |
| Heading ball              | 38          | 12.5%       | 4          | 2.5%        | 42         | 9.1%        |
| Goaltending               | 31          | 10.2%       | 7          | 4.4%        | 38         | 8.2%        |
| Chasing loose ball        | 26          | 8.6%        | 9          | 5.7%        | 35         | 7.6%        |
| Passing (foot)            | 15          | 5.0%        | 11         | 7.0%        | 26         | 5.6%        |
| Conditioning              | 2           | 0.7%        | 24         | 15.2%       | 26         | 5.6%        |
| Shooting (foot)           | 18          | 5.9%        | 6          | 3.8%        | 24         | 5.2%        |
| Receiving pass            | 12          | 4.0%        | ---        | 0.0%        | 12         | 2.6%        |
| Blocking shot             | 6           | 2.0%        | 4          | 2.5%        | 10         | 2.2%        |
| Receiving a slide tackle  | 5           | 1.7%        | ---        | 0.0%        | 5          | 1.1%        |
| Attempting a slide tackle | 1           | 0.3%        | ---        | 0.0%        | 1          | 0.2%        |
| Other                     | 3           | 1.0%        | 3          | 1.9%        | 6          | 1.3%        |
| <b>Total</b>              | <b>303</b>  | <b>100%</b> | <b>158</b> | <b>100%</b> | <b>461</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 5.5 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **VI. Boys' Volleyball Injury Epidemiology**

**Table 6.1 Boys' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>11</b>  | <b>20,840</b> | <b>0.53</b>                                      |
| Competition  | 8          | 7,470         | 1.07                                             |
| Practice     | 3          | 13,370        | 0.22                                             |

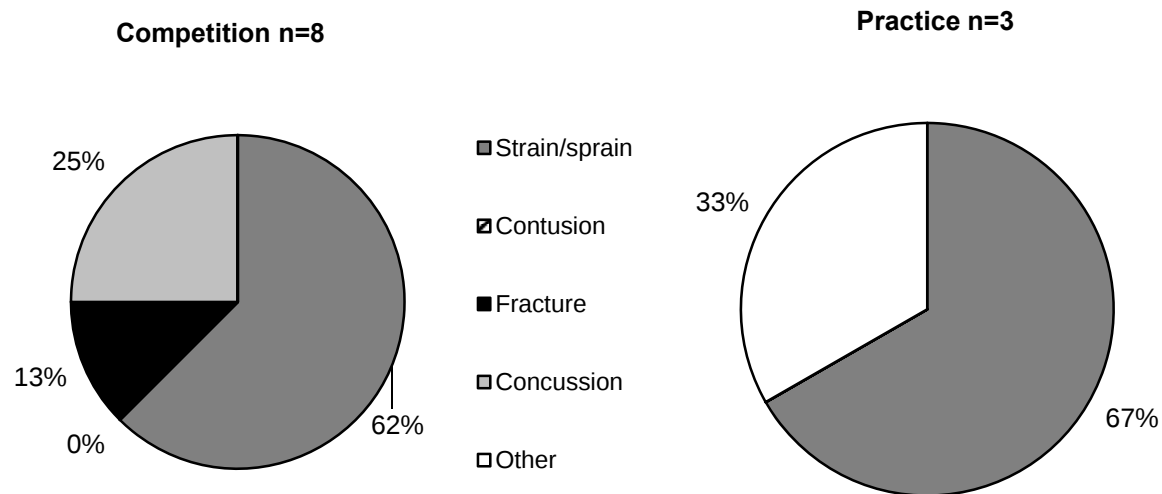
**Table 6.2 Demographic Characteristics of Injured Boys' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                       |             |
|-----------------------|-------------|
| <b>Year in School</b> | <b>n=11</b> |
| Freshman              | 0.0%        |
| Sophomore             | 27.3%       |
| Junior                | 63.6%       |
| Senior                | 9.1%        |
| <b>Total†</b>         | <b>100%</b> |
| <b>Age (years)</b>    |             |
| Minimum               | 15          |
| Maximum               | 18          |
| Mean (St. Dev.)       | 16.4 (0.9)  |
| <b>BMI</b>            |             |
| Minimum               | 20.8        |
| Maximum               | 31.4        |
| Mean (St. Dev.)       | 23.9 (3.3)  |

\*All analyses in this report present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 6.1 Diagnosis of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 6.3 Body Site of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Competition |             | Practice |             | Overall   |             |
|------------------|-------------|-------------|----------|-------------|-----------|-------------|
|                  | n           | %           | n        | %           | n         | %           |
| <b>Body Site</b> |             |             |          |             |           |             |
| Ankle            | 4           | 50.0%       | 2        | 66.7%       | 6         | 54.5%       |
| Head/face        | 2           | 25.0%       | 1        | 33.3%       | 3         | 27.3%       |
| Hand/wrist       | 1           | 12.5%       | ---      | 0.0%        | 1         | 9.1%        |
| Knee             | 1           | 12.5%       | ---      | 0.0%        | 1         | 9.1%        |
| <b>Total</b>     | <b>8</b>    | <b>100%</b> | <b>3</b> | <b>100%</b> | <b>11</b> | <b>100%</b> |

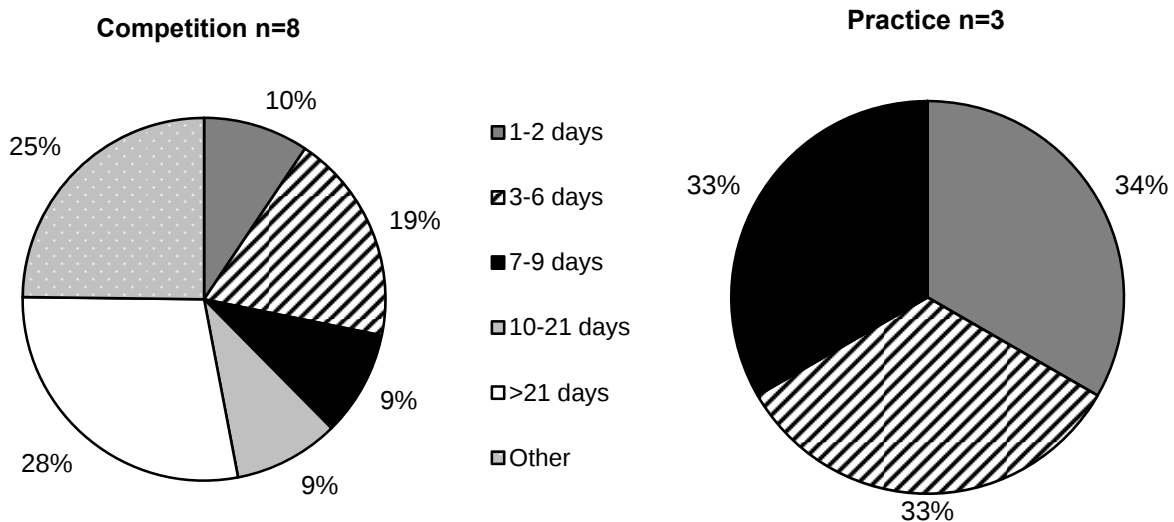
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 6.4 Most Common Boys' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                | Competition<br>n=8 |       | Practice<br>n=3 |       | Total<br>n=11 |       |
|--------------------------|--------------------|-------|-----------------|-------|---------------|-------|
|                          | n                  | %     | n               | %     | n             | %     |
| Ankle strain/sprain      | 4                  | 50.0% | 2               | 66.7% | 6             | 54.5% |
| Head/face concussion     | 2                  | 25.0% | ---             | 0.0%  | 2             | 18.2% |
| Hand/wrist strain/sprain | 1                  | 12.5% | ---             | 0.0%  | 1             | 9.1%  |
| Knee fracture            | 1                  | 12.5% | ---             | 0.0%  | 1             | 9.1%  |
| Head/face other          | ---                | 0.0%  | 1               | 33.3% | 1             | 9.1%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 6.2 Time Loss of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



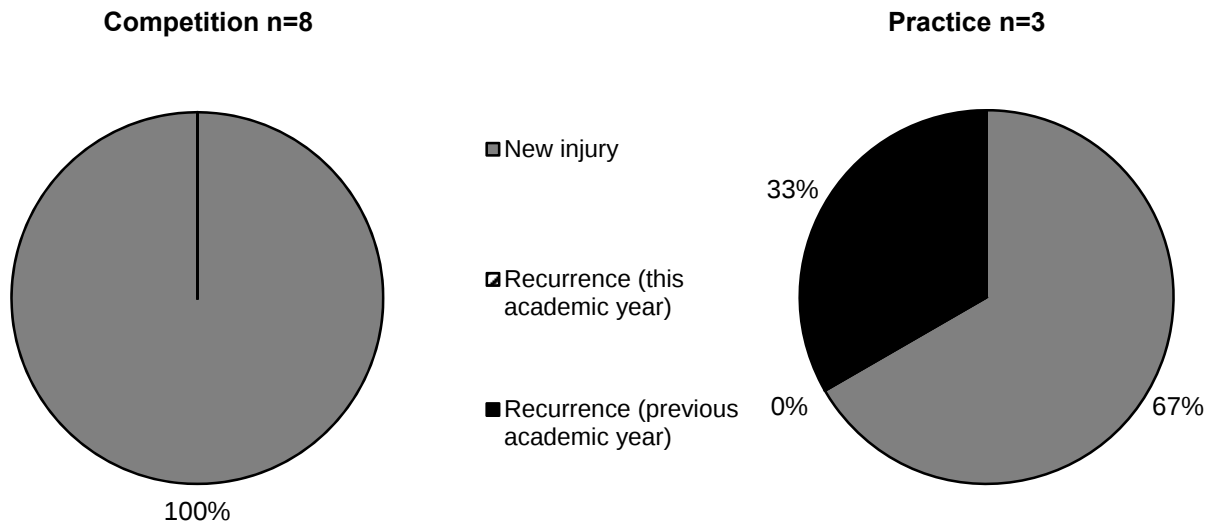
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 6.5 Boys' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice |             | Overall   |             |
|-------------------------|-------------|-------------|----------|-------------|-----------|-------------|
|                         | n           | %           | n        | %           | n         | %           |
| <b>Need for surgery</b> |             |             |          |             |           |             |
| Required surgery        | 1           | 12.5%       | 1        | 33.3%       | 2         | 18.2%       |
| Did not require surgery | 7           | 87.5%       | 2        | 66.7%       | 9         | 81.8%       |
| <b>Total</b>            | <b>8</b>    | <b>100%</b> | <b>3</b> | <b>100%</b> | <b>11</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 6.3 History of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 6.6 Time during Season of Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 1         | 9.1%        |
| Regular season        | 10        | 90.9%       |
| Post season           | ---       | 0.0%        |
| <b>Total</b>          | <b>11</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 6.7 Competition-Related Variables for Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | <b>n</b> | <b>%</b>    |
|----------------------------|----------|-------------|
| <b>Time in Competition</b> |          |             |
| Pre-competition/warm-ups   | 3        | 37.5%       |
| First game                 | 1        | 12.5%       |
| Second game                | 2        | 25.0%       |
| Third game                 | 2        | 25.0%       |
| <b>Total</b>               | <b>8</b> | <b>100%</b> |
| <b>Court Location</b>      |          |             |
| Left front                 | 1        | 12.5%       |
| Right forward              | 1        | 12.5%       |
| At the net                 | 3        | 37.5%       |
| Left back                  | 2        | 25.0%       |
| Outside court              | 1        | 12.5%       |
| <b>Total</b>               | <b>8</b> | <b>100%</b> |

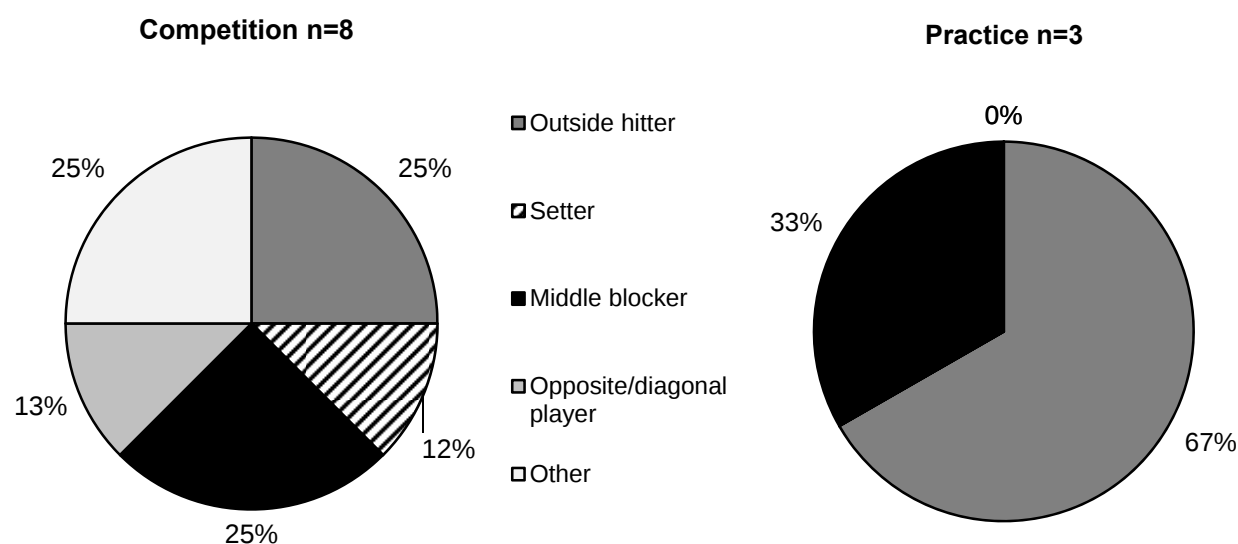
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 6.8 Practice-Related Variables for Boys' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | <b>n</b> | <b>%</b>    |
|-------------------------|----------|-------------|
| <b>Time in Practice</b> |          |             |
| First 1/2 hour          | ---      | 0.0%        |
| Second 1/2 hour         | 1        | 33.3%       |
| 1-2 hours into practice | 2        | 66.7%       |
| >2 hours into practice  | ---      | 0.0%        |
| <b>Total</b>            | <b>3</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 6.4 Player Position of Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

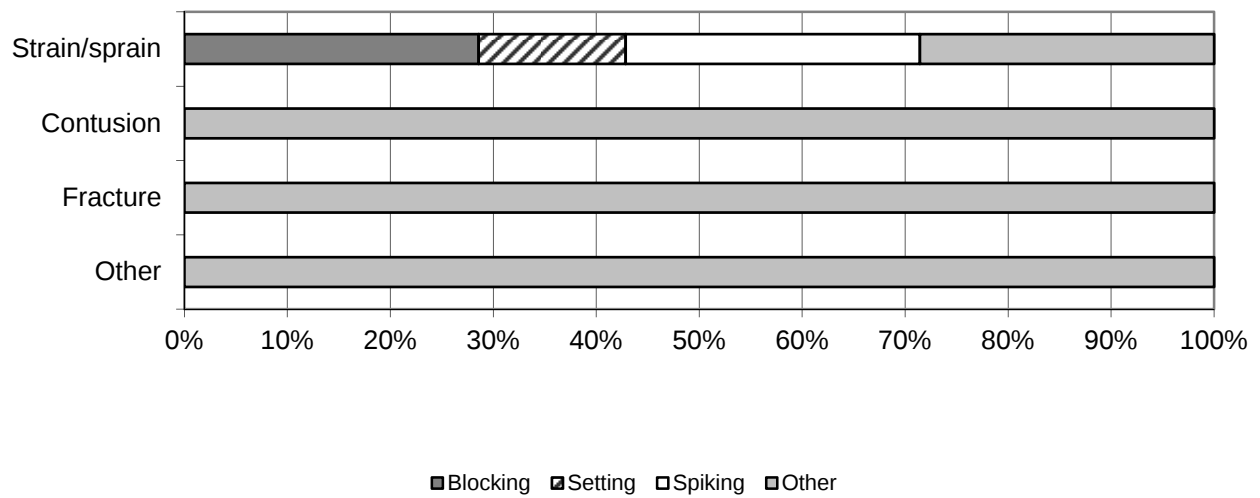


**Table 6.9 Activities Leading to Boys' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                 | Competition |             | Practice |             | Overall   |             |
|-----------------|-------------|-------------|----------|-------------|-----------|-------------|
|                 | n           | %           | n        | %           | n         | %           |
| <b>Activity</b> |             |             |          |             |           |             |
| Blocking        | 1           | 12.5%       | 1        | 33.3%       | 2         | 18.2%       |
| Spiking         | 1           | 12.5%       | 1        | 33.3%       | 2         | 18.2%       |
| General play    | 2           | 25.0%       | ---      | 0.0%        | 2         | 18.2%       |
| Digging         | 3           | 37.5%       | 1        | 33.3%       | 4         | 36.4%       |
| Setting         | 1           | 12.5%       | ---      | 0.0%        | 1         | 9.1%        |
| <b>Total</b>    | <b>8</b>    | <b>100%</b> | <b>3</b> | <b>100%</b> | <b>11</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 6.5 Activity Resulting in Boys' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **VII. Girls' Volleyball Injury Epidemiology**

**Table 7.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|----------------|----------------------------------------------|
| <b>Total</b> | <b>262</b> | <b>244,409</b> | <b>1.07</b>                                  |
| Competition  | 112        | 81,701         | 1.37                                         |
| Practice     | 150        | 162,708        | 0.92                                         |

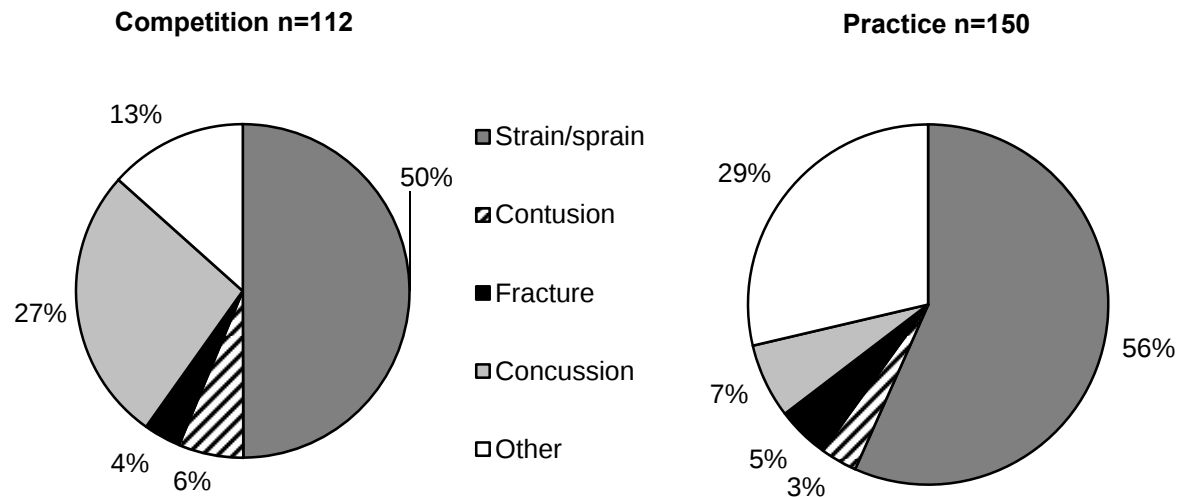
**Table 7.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=258</b> |
| Freshman                 | 28.7%        |
| Sophomore                | 27.1%        |
| Junior                   | 22.5%        |
| Senior                   | 21.7%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 18           |
| Mean (St. Dev.)          | 15.5 (1.2)   |
| <b>BMI</b>               |              |
| Minimum                  | 14.0         |
| Maximum                  | 36.2         |
| Mean (St. Dev.)          | 22.0 (3.2)   |

\*All analyses in this report present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 7.1 Diagnosis of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 7.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

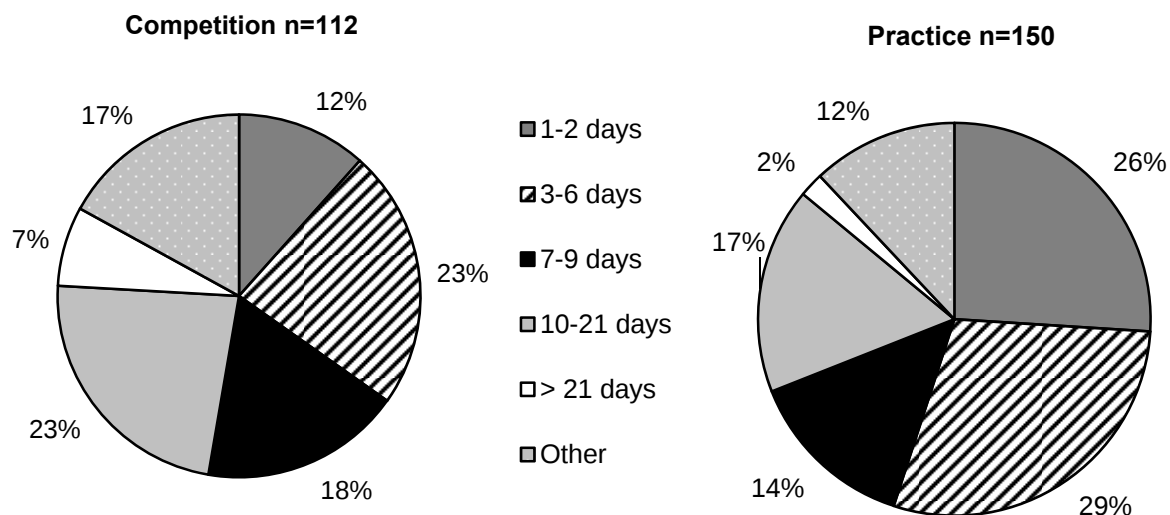
|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Ankle               | 33          | 29.5%       | 49         | 32.7%       | 82         | 31.3%       |
| Head/face           | 33          | 29.5%       | 10         | 6.7%        | 43         | 16.4%       |
| Hand/wrist          | 16          | 14.3%       | 22         | 14.7%       | 38         | 14.5%       |
| Knee                | 10          | 8.9%        | 16         | 10.7%       | 26         | 9.9%        |
| Trunk               | 5           | 4.5%        | 15         | 10.0%       | 20         | 7.6%        |
| Shoulder            | 4           | 3.6%        | 13         | 8.7%        | 17         | 6.5%        |
| Foot                | 1           | 0.9%        | 8          | 5.3%        | 9          | 3.4%        |
| Hip/thigh/upper leg | 3           | 2.7%        | 5          | 3.3%        | 8          | 3.1%        |
| Lower leg           | 2           | 1.8%        | 4          | 2.7%        | 6          | 2.3%        |
| Arm/elbow           | 4           | 3.6%        | 2          | 1.3%        | 6          | 2.3%        |
| Neck                | ---         | 0.0%        | 4          | 2.7%        | 4          | 1.5%        |
| Other               | 1           | 0.9%        | 2          | 1.3%        | 3          | 1.1%        |
| <b>Total</b>        | <b>112</b>  | <b>100%</b> | <b>150</b> | <b>100%</b> | <b>262</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 7.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Competition<br>n=112 |       | Practice<br>n=150 |       | Total<br>n=262 |       |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                    | %     | n                 | %     | n              | %     |
| <b>Diagnosis</b>                  |                      |       |                   |       |                |       |
| Ankle strain/sprain               | 31                   | 27.7% | 48                | 32.0% | 79             | 30.2% |
| Head/face concussion              | 30                   | 26.8% | 10                | 6.7%  | 40             | 15.3% |
| Hand/wrist strain/sprain          | 11                   | 9.8%  | 12                | 8.0%  | 23             | 8.8%  |
| Knee other                        | 4                    | 3.6%  | 11                | 7.3%  | 15             | 5.7%  |
| Shoulder other                    | 3                    | 2.7%  | 11                | 7.3%  | 14             | 5.3%  |
| Trunk strain/sprain               | 3                    | 2.7%  | 8                 | 5.3%  | 11             | 4.2%  |
| Knee strain/sprain                | 3                    | 2.7%  | 4                 | 2.7%  | 7              | 2.7%  |
| Hip/thigh/upper leg strain/sprain | 2                    | 1.8%  | 5                 | 3.3%  | 7              | 2.7%  |
| Knee contusion                    | 3                    | 2.7%  | 1                 | 0.7%  | 4              | 1.5%  |
| Lower leg strain/sprain           | 2                    | 1.8%  | 1                 | 0.7%  | 3              | 1.1%  |
| Shoulder strain/sprain            | 1                    | 0.9%  | 2                 | 1.3%  | 3              | 1.1%  |

**Figure 7.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



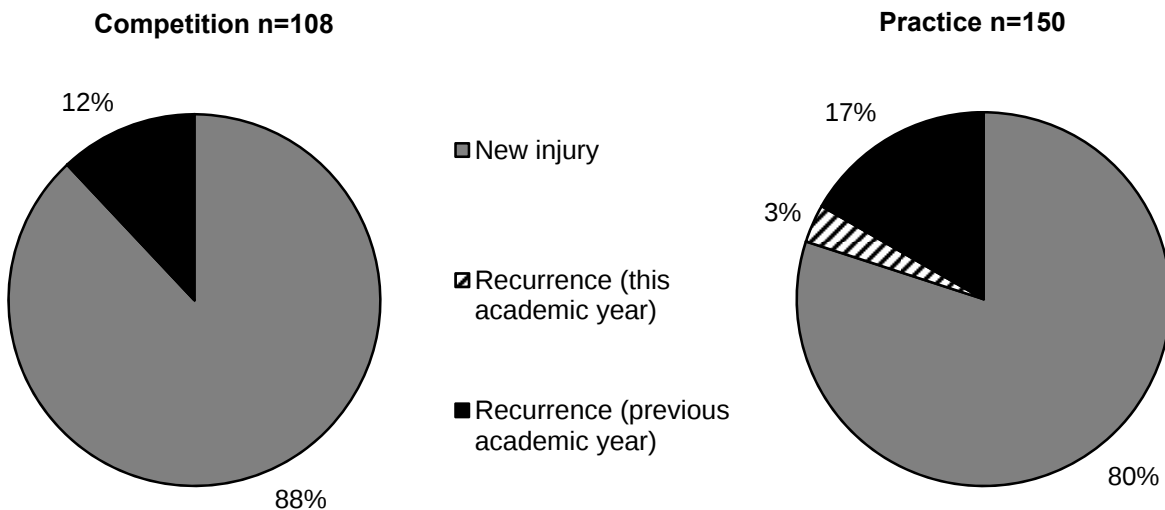
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 7.5 Girls' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 5           | 4.6%        | 6          | 4.1%        | 11         | 4.3%        |
| Did not require surgery | 103         | 95.4%       | 142        | 95.9%       | 245        | 95.7%       |
| <b>Total</b>            | <b>108</b>  | <b>100%</b> | <b>148</b> | <b>100%</b> | <b>256</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 7.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 7.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 63         | 24.2%       |
| Regular season        | 192        | 73.8%       |
| Post season           | 5          | 1.9%        |
| <b>Total</b>          | <b>260</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 7.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                 | n          | %           |
|---------------------------------|------------|-------------|
| <b>Time in Competition</b>      |            |             |
| Pre-competition/warm-ups        | 20         | 18.9%       |
| First game                      | 9          | 8.5%        |
| Second game                     | 45         | 42.5%       |
| Third game                      | 27         | 25.5%       |
| Fourth game                     | 4          | 3.8%        |
| Fifth game                      | 1          | 0.9%        |
| <b>Total</b>                    | <b>106</b> | <b>100%</b> |
| <b>Court Location</b>           |            |             |
| Middle forward                  | 18         | 17.0%       |
| Left back                       | 24         | 22.6%       |
| Right forward                   | 23         | 21.7%       |
| Left forward                    | 11         | 10.4%       |
| Outside court (your side)       | 4          | 3.8%        |
| Outside court (opponent's side) | 1          | 0.9%        |
| Outside the playable area       | 10         | 9.4%        |
| At the net                      | 9          | 8.5%        |
| Right back (server)             | 6          | 5.7%        |
| <b>Total</b>                    | <b>106</b> | <b>100%</b> |

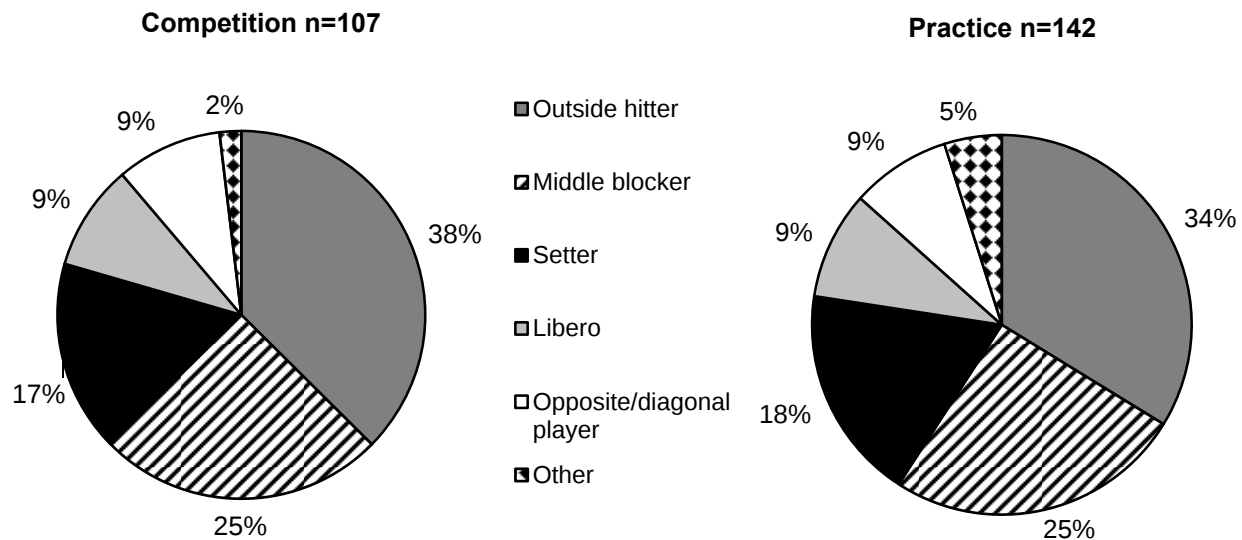
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 7.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 20         | 13.9%       |
| Second 1/2 hour         | 22         | 15.3%       |
| 1-2 hours into practice | 91         | 63.2%       |
| >2 hours into practice  | 11         | 7.6%        |
| <b>Total</b>            | <b>144</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 7.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

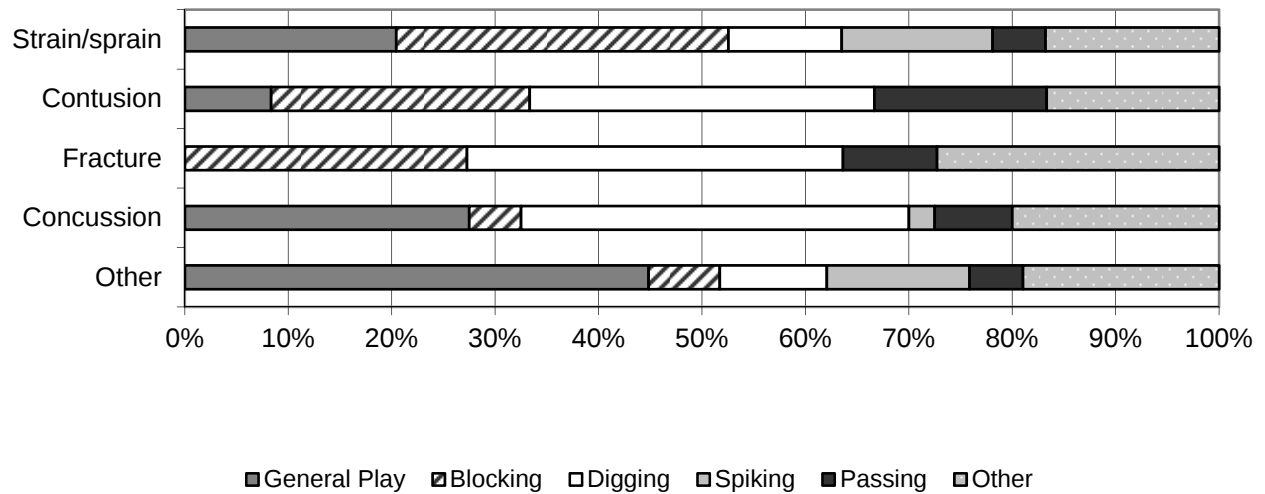


**Table 7.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                 | Competition |             | Practice   |             | Overall    |             |
|-----------------|-------------|-------------|------------|-------------|------------|-------------|
|                 | n           | %           | n          | %           | n          | %           |
| <b>Activity</b> |             |             |            |             |            |             |
| General play    | 21          | 19.1%       | 45         | 30.4%       | 66         | 25.6%       |
| Blocking        | 24          | 21.8%       | 32         | 21.6%       | 56         | 21.7%       |
| Digging         | 28          | 25.5%       | 16         | 10.8%       | 44         | 17.1%       |
| Spiking         | 13          | 11.8%       | 16         | 10.8%       | 29         | 11.2%       |
| Setting         | 9           | 8.2%        | 8          | 5.4%        | 17         | 6.6%        |
| Passing         | 8           | 7.3%        | 8          | 5.4%        | 16         | 6.2%        |
| Serving         | 2           | 1.8%        | 7          | 4.7%        | 9          | 3.5%        |
| Conditioning    | 1           | 0.9%        | 8          | 5.4%        | 9          | 3.5%        |
| Other           | 4           | 3.6%        | 8          | 5.4%        | 12         | 4.7%        |
| <b>Total</b>    | <b>110</b>  | <b>100%</b> | <b>148</b> | <b>100%</b> | <b>258</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 7.5 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **VIII. Boys' Basketball Injury Epidemiology**

**Table 8.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>410</b> | <b>298,304</b> | <b>1.37</b>                                      |
| Competition  | 225        | 87,673         | 2.57                                             |
| Practice     | 185        | 210,631        | 0.88                                             |

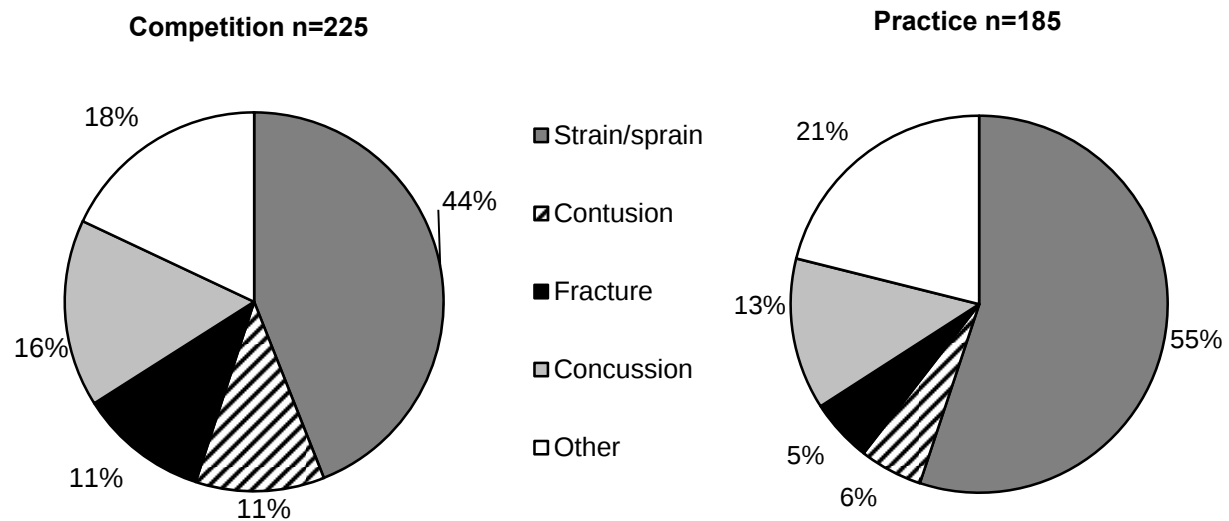
**Table 8.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=410</b> |
| Freshman                 | 22.9%        |
| Sophomore                | 27.1%        |
| Junior                   | 24.6%        |
| Senior                   | 25.4%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 19           |
| Mean (St. Dev.)          | 16.0 (1.2)   |
| <b>BMI</b>               |              |
| Minimum                  | 16.0         |
| Maximum                  | 47.4         |
| Mean (St. Dev.)          | 23.1 (3.4)   |

\*All analyses in this report present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 8.1 Diagnosis of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 8.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Ankle               | 68          | 30.2%       | 71         | 38.6%       | 139        | 34.0%       |
| Head/face           | 56          | 24.9%       | 34         | 18.5%       | 90         | 22.0%       |
| Knee                | 29          | 12.9%       | 26         | 14.1%       | 55         | 13.4%       |
| Hand/wrist          | 20          | 8.9%        | 13         | 7.1%        | 33         | 8.1%        |
| Hip/thigh/upper leg | 13          | 5.8%        | 11         | 6.0%        | 24         | 5.9%        |
| Trunk               | 12          | 5.3%        | 12         | 6.5%        | 24         | 5.9%        |
| Lower leg           | 5           | 2.2%        | 9          | 4.9%        | 14         | 3.4%        |
| Foot                | 8           | 3.6%        | 4          | 2.2%        | 12         | 2.9%        |
| Shoulder            | 8           | 3.6%        | 1          | 0.5%        | 9          | 2.2%        |
| Arm/elbow           | 5           | 2.2%        | 3          | 1.6%        | 8          | 2.0%        |
| Neck                | 1           | 0.4%        | ---        | 0.0%        | 1          | 0.2%        |
| <b>Total</b>        | <b>225</b>  | <b>100%</b> | <b>184</b> | <b>100%</b> | <b>409</b> | <b>100%</b> |

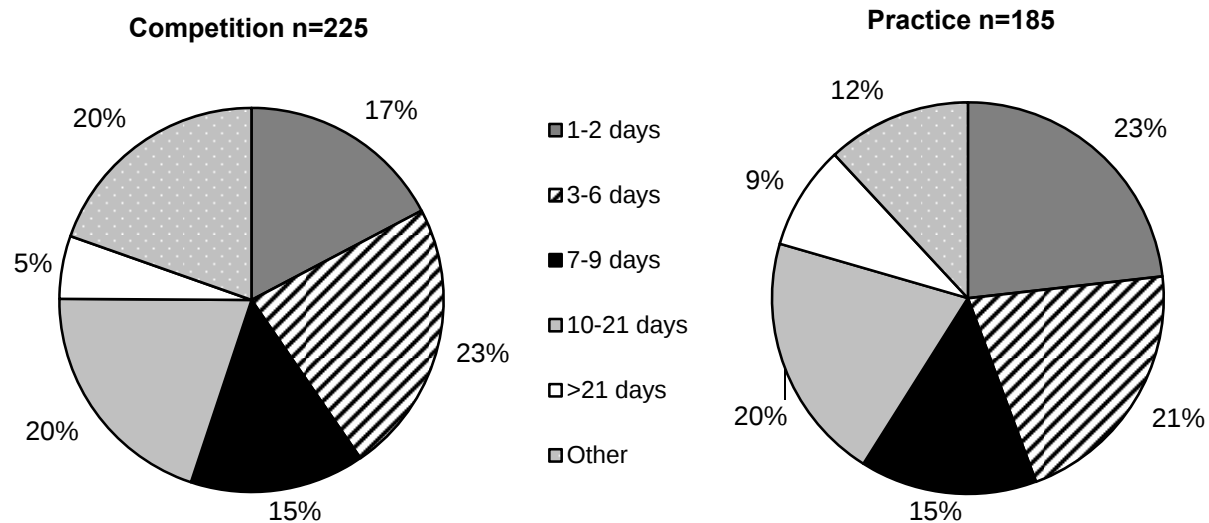
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 8.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                     | Competition<br>n=225 |       | Practice<br>n=184 |       | Total<br>n=409 |       |
|-------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                               | n                    | %     | n                 | %     | n              | %     |
| Ankle strain/sprain           | 66                   | 29.3% | 68                | 37.0% | 134            | 32.8% |
| Head/face concussion          | 37                   | 16.4% | 24                | 13.0% | 61             | 14.9% |
| Knee other                    | 15                   | 6.7%  | 11                | 6.0%  | 26             | 6.4%  |
| Knee strain/sprain            | 9                    | 4.0%  | 13                | 7.1%  | 22             | 5.4%  |
| Head/face other               | 12                   | 5.3%  | 8                 | 4.3%  | 20             | 4.9%  |
| Hand/wrist strain/sprain      | 10                   | 4.4%  | 6                 | 3.3%  | 16             | 3.9%  |
| Hip/thigh/upper leg contusion | 11                   | 4.9%  | 3                 | 1.6%  | 14             | 3.4%  |
| Hand/wrist fracture           | 7                    | 3.1%  | 6                 | 3.3%  | 13             | 3.2%  |
| Trunk other                   | 4                    | 1.8%  | 7                 | 3.8%  | 11             | 2.7%  |
| Trunk strain/sprain           | 4                    | 1.8%  | 4                 | 2.2%  | 8              | 2.0%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 8.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



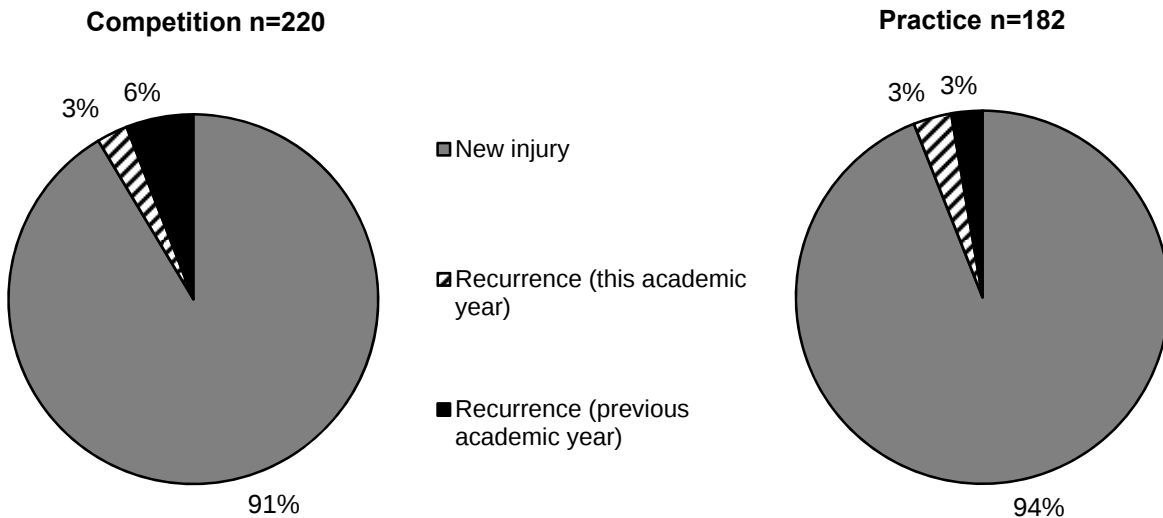
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 8.5 Boys' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 14          | 6.3%        | 5          | 2.7%        | 19         | 4.7%        |
| Did not require surgery | 209         | 93.7%       | 178        | 97.3%       | 387        | 95.3%       |
| <b>Total</b>            | <b>223</b>  | <b>100%</b> | <b>183</b> | <b>100%</b> | <b>406</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 8.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 8.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 64         | 15.6%       |
| Regular season        | 323        | 78.8%       |
| Post season           | 23         | 5.6%        |
| <b>Total</b>          | <b>410</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 8.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                     | n          | %           |
|-------------------------------------|------------|-------------|
| <b>Time in Competition</b>          |            |             |
| Pre-competition-warm-ups            | 5          | 2.4%        |
| First quarter                       | 18         | 8.6%        |
| Second quarter                      | 44         | 21.0%       |
| Third quarter                       | 85         | 40.5%       |
| Fourth quarter                      | 58         | 27.6%       |
| Overtime                            | -          | 0.0%        |
| <b>Total</b>                        | <b>210</b> | <b>100%</b> |
| <b>Court Location</b>               |            |             |
| Inside lane (offense)               | 57         | 27.7%       |
| Inside lane (defense)               | 53         | 25.7%       |
| Between 3 pt arc and lane (defense) | 27         | 13.1%       |
| Between 3 pt arc and lane (offense) | 14         | 6.8%        |
| Outside 3 point arc - offense       | 18         | 8.7%        |
| Backcourt                           | 12         | 5.8%        |
| Outside 3 point arc - defense       | 16         | 7.8%        |
| Out of bounds                       | 5          | 2.4%        |
| Off the court                       | 4          | 1.9%        |
| <b>Total</b>                        | <b>206</b> | <b>100%</b> |

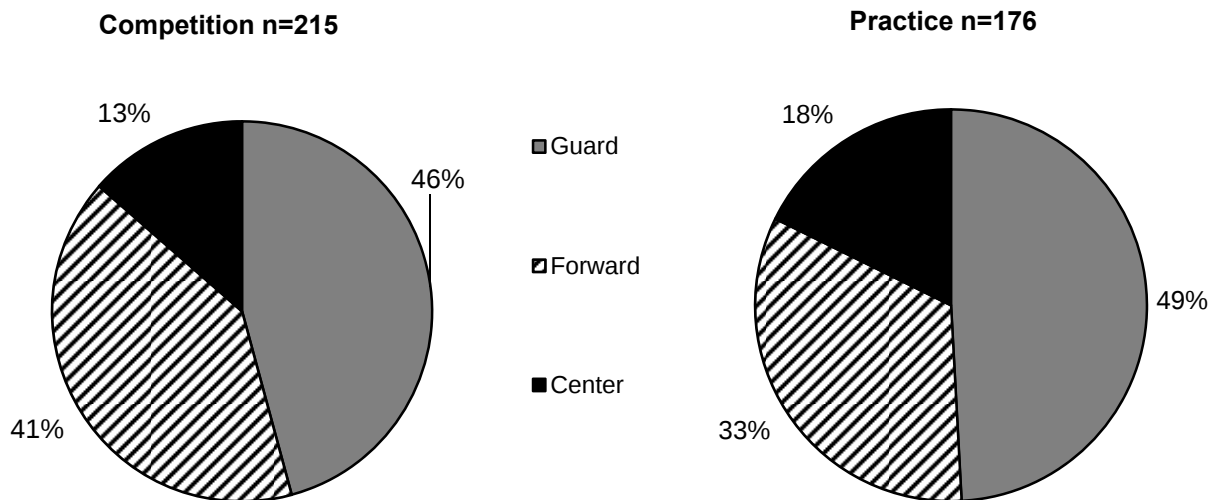
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 8.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 20         | 11.6%       |
| Second 1/2 hour         | 37         | 21.5%       |
| 1-2 hours into practice | 108        | 62.8%       |
| >2 hours into practice  | 7          | 4.1%        |
| <b>Total</b>            | <b>172</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 8.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

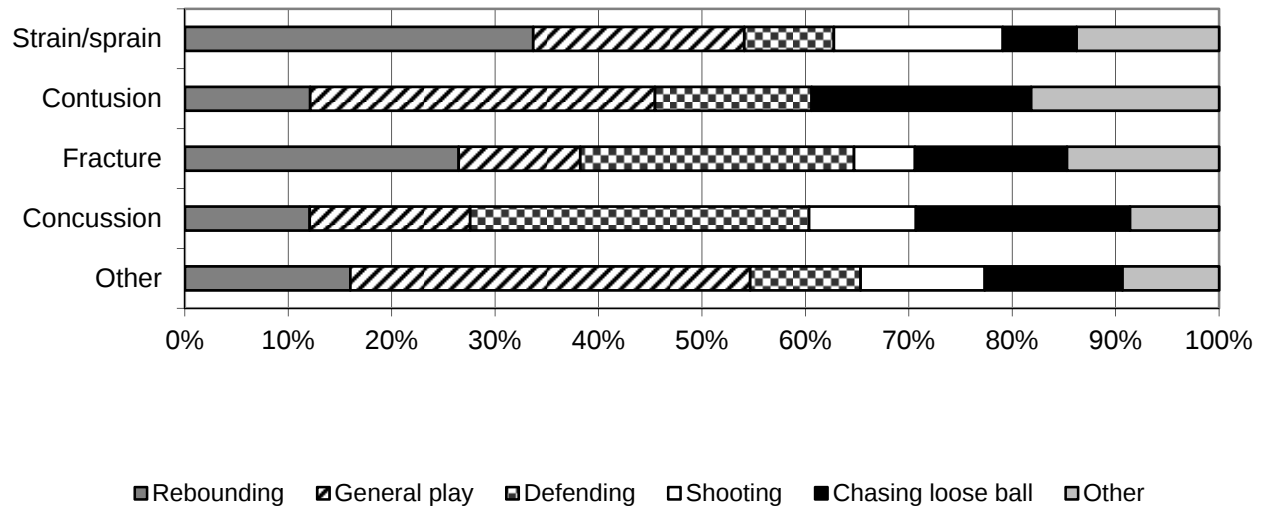


**Table 8.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Activity</b>         |             |             |            |             |            |             |
| Rebounding              | 57          | 26.1%       | 41         | 23.0%       | 98         | 24.7%       |
| General play            | 44          | 20.2%       | 49         | 27.5%       | 93         | 23.5%       |
| Defending               | 37          | 17.0%       | 21         | 11.8%       | 58         | 14.6%       |
| Shooting                | 24          | 11.0%       | 25         | 14.0%       | 49         | 12.4%       |
| Chasing loose ball      | 32          | 14.7%       | 16         | 9.0%        | 48         | 12.1%       |
| Ball handling/dribbling | 9           | 4.1%        | 10         | 5.6%        | 19         | 4.8%        |
| Receiving pass          | 7           | 3.2%        | 6          | 3.4%        | 13         | 3.3%        |
| Conditioning            | ---         | 0.0%        | 4          | 2.2%        | 4          | 1.0%        |
| Passing                 | 2           | 0.9%        | 1          | 0.6%        | 3          | 0.8%        |
| Screening               | 1           | 0.5%        | 1          | 0.6%        | 2          | 0.5%        |
| Other                   | 5           | 2.3%        | 4          | 2.2%        | 9          | 2.3%        |
| <b>Total</b>            | <b>218</b>  | <b>100%</b> | <b>178</b> | <b>100%</b> | <b>396</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 8.5 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **IX. Girls' Basketball Injury Epidemiology**

**Table 9.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>423</b> | <b>237,140</b> | <b>1.78</b>                                      |
| Competition  | 245        | 69,877         | 3.51                                             |
| Practice     | 178        | 167,263        | 1.06                                             |

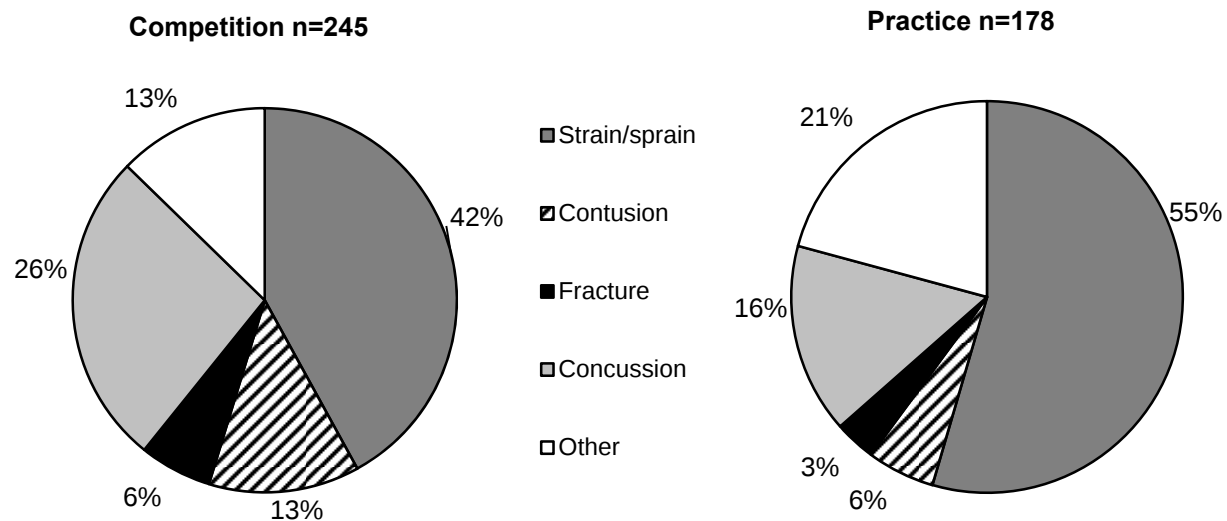
**Table 9.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=423</b> |
| Freshman                 | 31.3%        |
| Sophomore                | 28.4%        |
| Junior                   | 19.7%        |
| Senior                   | 20.6%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 12           |
| Maximum                  | 19           |
| Mean (St. Dev.)          | 15.7 (1.2)   |
| <b>BMI</b>               |              |
| Minimum                  | 14.0         |
| Maximum                  | 36.9         |
| Mean (St. Dev.)          | 22.8 (3.5)   |

\*All analyses in this report present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 9.1 Diagnosis of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 9.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

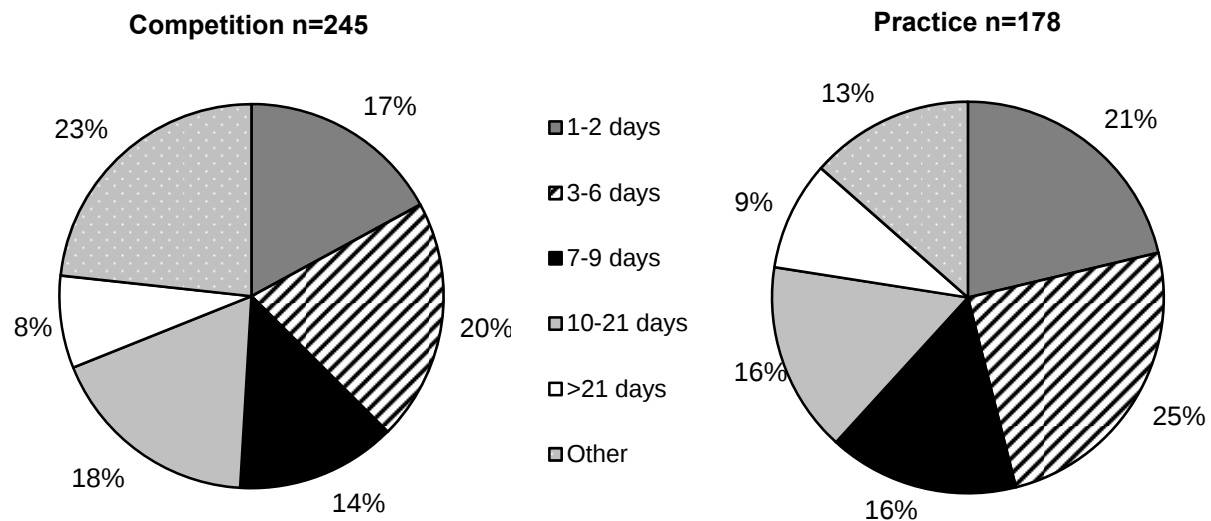
|                     | Competition |            | Practice   |             | Overall    |             |
|---------------------|-------------|------------|------------|-------------|------------|-------------|
|                     | n           | %          | n          | %           | n          | %           |
| <b>Body Site</b>    |             |            |            |             |            |             |
| Head/face           | 74          | 30.2%      | 32         | 18.1%       | 106        | 25.1%       |
| Ankle               | 48          | 19.6%      | 45         | 25.4%       | 93         | 22.0%       |
| Knee                | 57          | 23.3%      | 34         | 19.2%       | 91         | 21.6%       |
| Hand/wrist          | 26          | 10.6%      | 13         | 7.3%        | 39         | 9.2%        |
| Hip/thigh/upper leg | 9           | 3.7%       | 14         | 7.9%        | 23         | 5.5%        |
| Trunk               | 10          | 4.1%       | 8          | 4.5%        | 18         | 4.3%        |
| Lower leg           | 6           | 2.4%       | 10         | 5.6%        | 16         | 3.8%        |
| Shoulder            | 7           | 2.9%       | 7          | 4.0%        | 14         | 3.3%        |
| Foot                | 4           | 1.6%       | 6          | 3.4%        | 10         | 2.4%        |
| Arm/elbow           | 3           | 1.2%       | 3          | 1.7%        | 6          | 1.4%        |
| Neck                | 1           | 0.4%       | 1          | 0.6%        | 2          | 0.5%        |
| Other               | ---         | 0.0%       | 4          | 2.3%        | 4          | 0.9%        |
| <b>Total</b>        | <b>245</b>  | <b>100</b> | <b>177</b> | <b>100%</b> | <b>422</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 9.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=245 |       | Practice<br>n=177 |       | Total<br>n=422 |       |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                    | %     | n                 | %     | n              | %     |
| Head/face concussion              | 65                   | 26.5% | 28                | 15.8% | 93             | 22.0% |
| Ankle strain/sprain               | 46                   | 18.8% | 44                | 24.9% | 90             | 21.3% |
| Knee strain/sprain                | 27                   | 11.0% | 17                | 9.6%  | 44             | 10.4% |
| Knee other                        | 17                   | 6.9%  | 12                | 6.8%  | 29             | 6.9%  |
| Hand/wrist strain/sprain          | 16                   | 6.5%  | 8                 | 4.5%  | 24             | 5.7%  |
| Hip/thigh/upper leg strain/sprain | 4                    | 1.6%  | 13                | 7.3%  | 17             | 4.0%  |
| Knee contusion                    | 12                   | 4.9%  | 5                 | 2.8%  | 17             | 4.0%  |
| Hand/wrist fracture               | 7                    | 2.9%  | 3                 | 1.7%  | 10             | 2.4%  |
| Trunk strain/sprain               | 4                    | 1.6%  | 5                 | 2.8%  | 9              | 2.1%  |
| Lower leg other                   | ---                  | 0.0%  | 7                 | 4.0%  | 7              | 1.7%  |

**Figure 9.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



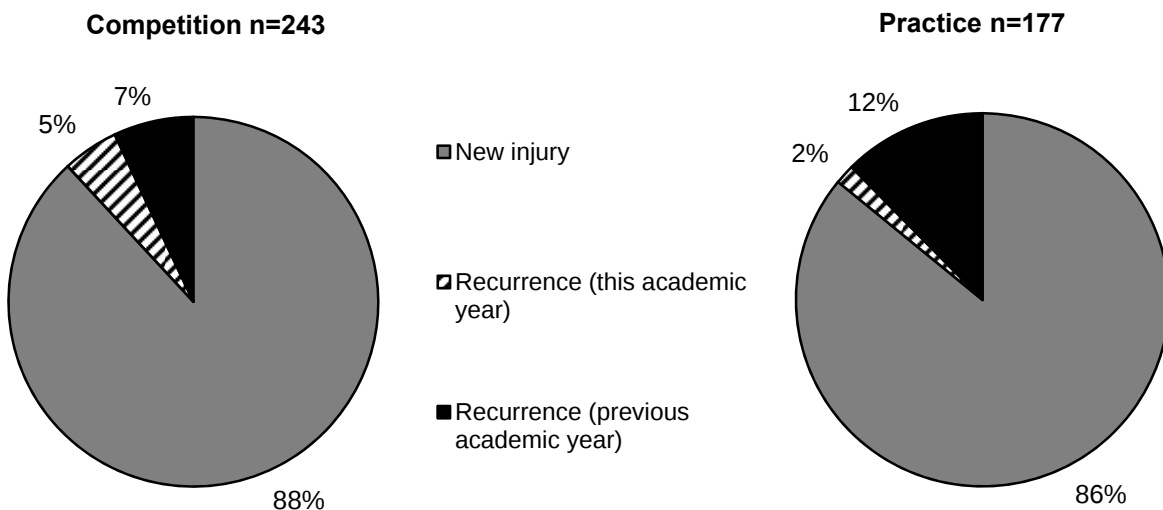
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 9.5 Girls' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 22          | 9.1%        | 12         | 6.9%        | 34         | 8.2%        |
| Did not require surgery | 219         | 90.9        | 162        | 93.1%       | 381        | 91.8%       |
| <b>Total</b>            | <b>241</b>  | <b>100%</b> | <b>174</b> | <b>100%</b> | <b>415</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 9.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 9.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 74         | 17.6%       |
| Regular season        | 335        | 79.8%       |
| Post season           | 11         | 2.6%        |
| <b>Total</b>          | <b>420</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 9.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                        | n          | %           |
|----------------------------------------|------------|-------------|
| <b>Time in Competition</b>             |            |             |
| Pre-competition/Warm-ups               | 8          | 3.4%        |
| First quarter                          | 19         | 8.2%        |
| Second quarter                         | 54         | 23.2%       |
| Third quarter                          | 78         | 33.5%       |
| Fourth quarter                         | 74         | 31.8%       |
| Overtime                               | ---        | 0.0%        |
| <b>Total</b>                           | <b>233</b> | <b>100%</b> |
| <b>Court Location</b>                  |            |             |
| Inside lane (offense)                  | 45         | 19.7%       |
| Inside lane (defense)                  | 59         | 25.8%       |
| Between 3 point arc and lane (defense) | 31         | 13.5%       |
| Between 3 point arc and lane (offense) | 29         | 12.7%       |
| Outside 3 point arc - offense          | 25         | 10.9%       |
| Outside 3 point arc - defense          | 22         | 9.6%        |
| Backcourt                              | 11         | 4.8%        |
| Out of bounds                          | 4          | 1.7%        |
| Off the court                          | 3          | 1.3%        |
| <b>Total</b>                           | <b>229</b> | <b>100%</b> |

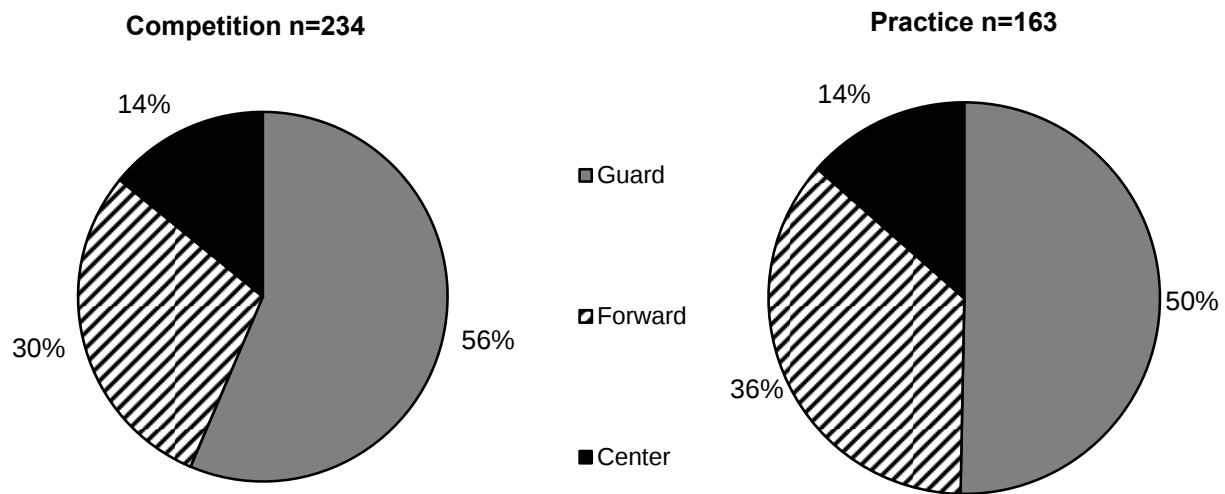
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 9.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 14         | 9.1%        |
| Second 1/2 hour         | 32         | 20.8%       |
| 1-2 hours into practice | 101        | 65.6%       |
| >2 hours into practice  | 7          | 4.5%        |
| <b>Total</b>            | <b>154</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 9.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

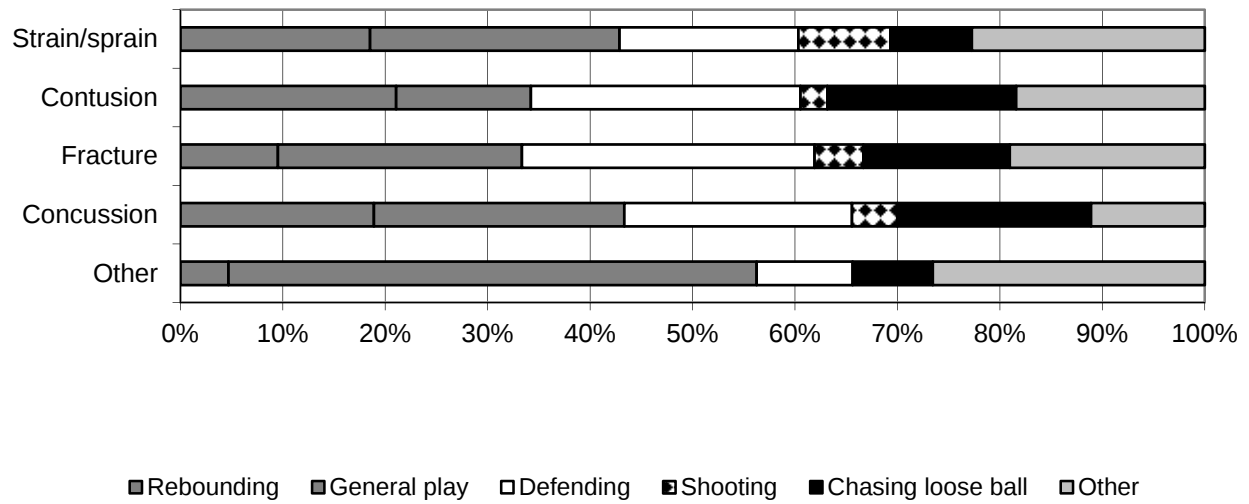


**Table 9.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| General play            | 51          | 21.3%       | 60         | 36.8%       | 111        | 27.6%       |
| Defending               | 54          | 22.6%       | 21         | 12.9%       | 75         | 18.7%       |
| Rebounding              | 43          | 18.0%       | 22         | 13.5%       | 65         | 16.2%       |
| Chasing loose ball      | 33          | 13.8%       | 14         | 8.6%        | 47         | 11.7%       |
| Ball handling/dribbling | 27          | 11.3%       | 5          | 3.1%        | 32         | 8.0%        |
| Shooting                | 17          | 7.1%        | 6          | 3.7%        | 23         | 5.7%        |
| Conditioning            | ---         | 0.0%        | 21         | 12.9%       | 21         | 5.2%        |
| Receiving pass          | 8           | 3.3%        | 9          | 5.5%        | 17         | 4.2%        |
| Passing                 | 5           | 2.1%        | 2          | 1.2%        | 7          | 1.7%        |
| Screening               | ---         | 0.0%        | ---        | 0.0%        | ---        | 0.0%        |
| Other                   | 1           | 0.4%        | 3          | 1.8%        | 4          | 1.0%        |
| <b>Total</b>            | <b>239</b>  | <b>100%</b> | <b>163</b> | <b>100%</b> | <b>402</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 9.5 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **X. Wrestling Injury Epidemiology**

**Table 10.1 Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|----------------|----------------------------------------------|
| <b>Total</b> | <b>475</b> | <b>214,710</b> | <b>2.21</b>                                  |
| Competition  | 189        | 56,794         | 3.33                                         |
| Practice     | 286        | 157,916        | 1.81                                         |

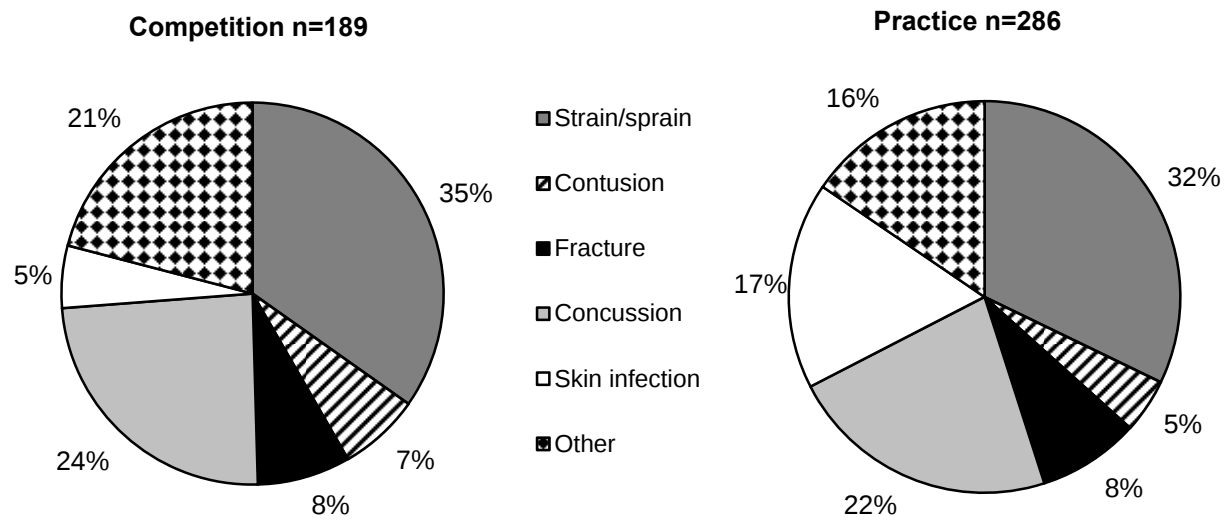
**Table 10.2 Demographic Characteristics of Injured Wrestlers, High School Sports-Related Injury Surveillance Study, US, 201-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=468</b> |
| Freshman                 | 26.7%        |
| Sophomore                | 26.3%        |
| Junior                   | 23.5%        |
| Senior                   | 23.5%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 18           |
| Mean (St. Dev.)          | 15.8 (1.3)   |
| <b>BMI</b>               |              |
| Minimum                  | 15.5         |
| Maximum                  | 48.7         |
| Mean (St. Dev.)          | 23.4 (4.8)   |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 10.1 Diagnosis of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 10.3 Body Site of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Head/face           | 57          | 30.2%       | 84         | 29.4%       | 141        | 29.7%       |
| Knee                | 29          | 15.3%       | 31         | 10.8%       | 60         | 12.6%       |
| Shoulder            | 25          | 13.2%       | 33         | 11.5%       | 58         | 12.2%       |
| Arm/elbow           | 18          | 9.5%        | 19         | 6.6%        | 37         | 7.8%        |
| Trunk               | 8           | 4.2%        | 25         | 8.7%        | 33         | 6.9%        |
| Hand/wrist          | 14          | 7.4%        | 19         | 6.6%        | 33         | 6.9%        |
| Ankle               | 14          | 7.4%        | 16         | 5.6%        | 30         | 6.3%        |
| Lower leg           | 4           | 2.1%        | 13         | 4.5%        | 17         | 3.6%        |
| Hip/thigh/upper leg | 4           | 2.1%        | 12         | 4.2%        | 16         | 3.4%        |
| Neck                | 3           | 1.6%        | 13         | 4.5%        | 16         | 3.4%        |
| Foot                | ---         | 0.0%        | 10         | 3.5%        | 10         | 2.1%        |
| Other               | 13          | 6.9%        | 11         | 3.8%        | 24         | 5.1%        |
| <b>Total</b>        | <b>189</b>  | <b>100%</b> | <b>286</b> | <b>100%</b> | <b>475</b> | <b>100%</b> |

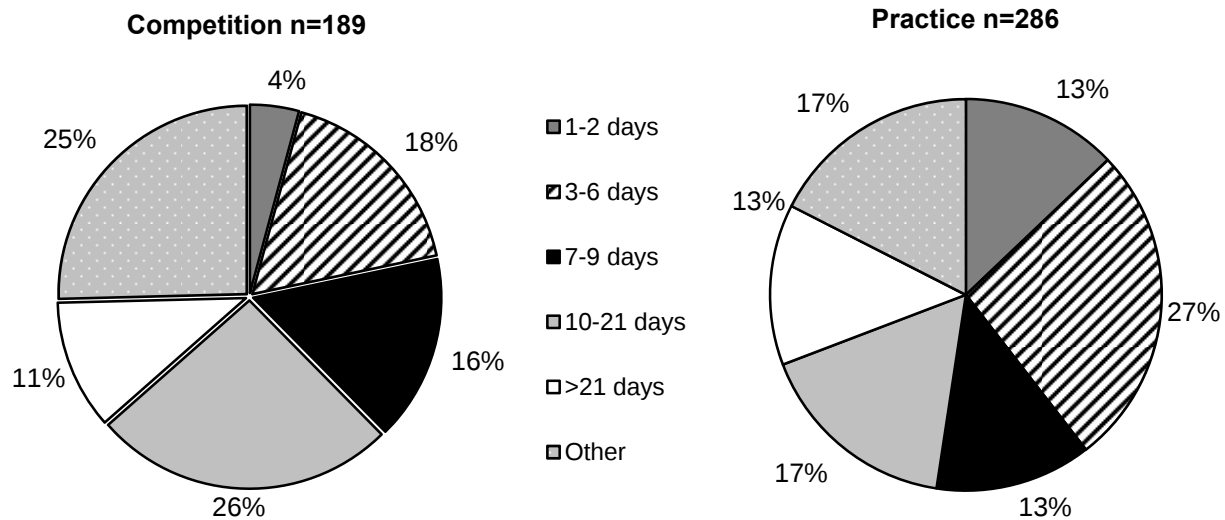
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 10.4 Ten Most Common Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                          | Competition<br>n=189 |       | Practice<br>n=286 |       | Total<br>n=475 |       |
|--------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                          | n                    | %     | n                 | %     | n              | %     |
| <b>Diagnosis</b>         |                      |       |                   |       |                |       |
| Head/face concussion     | 46                   | 24.3% | 63                | 22.0% | 109            | 22.9% |
| Shoulder strain/sprain   | 18                   | 9.5%  | 16                | 5.6%  | 34             | 7.2%  |
| Knee strain/sprain       | 15                   | 7.9%  | 16                | 5.6%  | 31             | 6.5%  |
| Ankle strain/sprain      | 11                   | 5.8%  | 15                | 5.2%  | 26             | 5.5%  |
| Shoulder other           | 7                    | 3.7%  | 15                | 5.2%  | 22             | 4.6%  |
| Knee other               | 9                    | 4.8%  | 10                | 3.5%  | 19             | 4.0%  |
| Head/face skin infection | 4                    | 2.1%  | 12                | 4.2%  | 16             | 3.4%  |
| Trunk strain/sprain      | 2                    | 1.1%  | 12                | 4.2%  | 14             | 2.9%  |
| Arm/elbow strain/sprain  | 7                    | 3.7%  | 6                 | 2.1%  | 13             | 2.7%  |
| Hand/wrist strain/sprain | 3                    | 1.6%  | 6                 | 2.1%  | 9              | 1.9%  |
| Neck strain/sprain       | 1                    | 0.5%  | 7                 | 2.4%  | 8              | 1.7%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 10.2 Time Loss of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



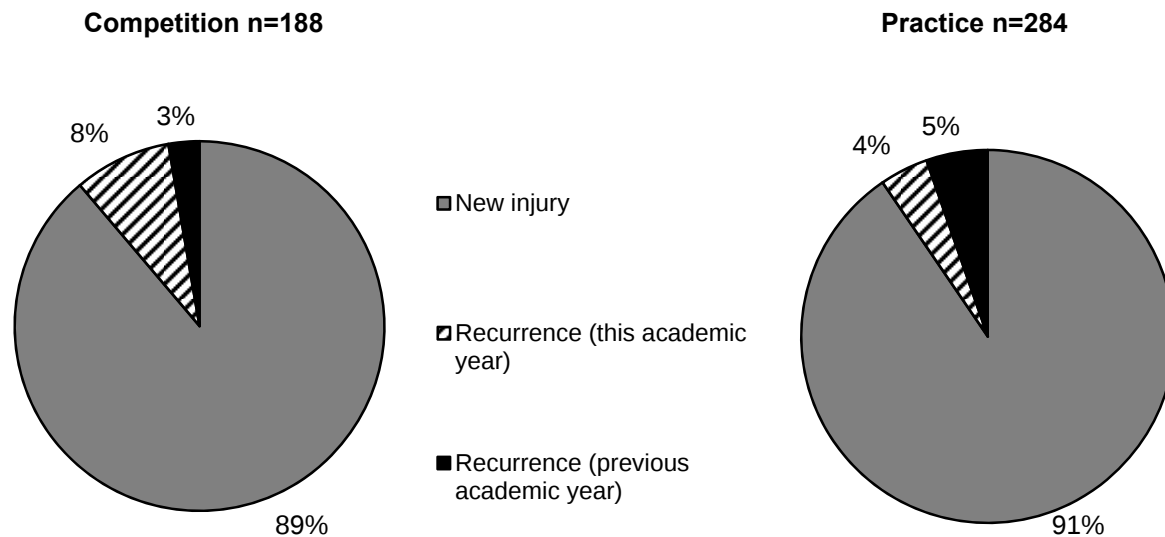
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 10.5 Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 15          | 8.0%        | 17         | 6.1%        | 32         | 6.8%        |
| Did not require surgery | 173         | 92.0%       | 262        | 93.9%       | 435        | 93.2%       |
| <b>Total</b>            | <b>188</b>  | <b>100%</b> | <b>279</b> | <b>100%</b> | <b>467</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 10.3 History of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 10.6 Time during Season of Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 77         | 16.3%       |
| Regular season        | 381        | 80.9%       |
| Post season           | 13         | 2.8%        |
| <b>Total</b>          | <b>471</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 10.7 Competition-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | n          | %           |
|----------------------------|------------|-------------|
| <b>Time in Competition</b> |            |             |
| Pre-competition/warm-ups   | 4          | 2.4%        |
| First period               | 35         | 20.8%       |
| Second period              | 77         | 45.8%       |
| Third period               | 52         | 31.0%       |
| Overtime                   | ---        | 0.0%        |
| <b>Total</b>               | <b>168</b> | <b>100%</b> |
| <b>Mat Location*</b>       |            |             |
| Within 28 ft. circle       | 363        | 86.2%       |
| Out of bounds              | 31         | 7.4%        |
| Off the mat                | 27         | 6.4%        |
| <b>Total</b>               | <b>421</b> | <b>100%</b> |

\*Mat location question consists of competition and practice related injuries.

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 10.8 Practice-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 33         | 12.9%       |
| Second 1/2 hour         | 30         | 11.8%       |
| 1-2 hours into practice | 154        | 60.4%       |
| >2 hours into practice  | 38         | 14.9%       |
| <b>Total</b>            | <b>255</b> | <b>100%</b> |

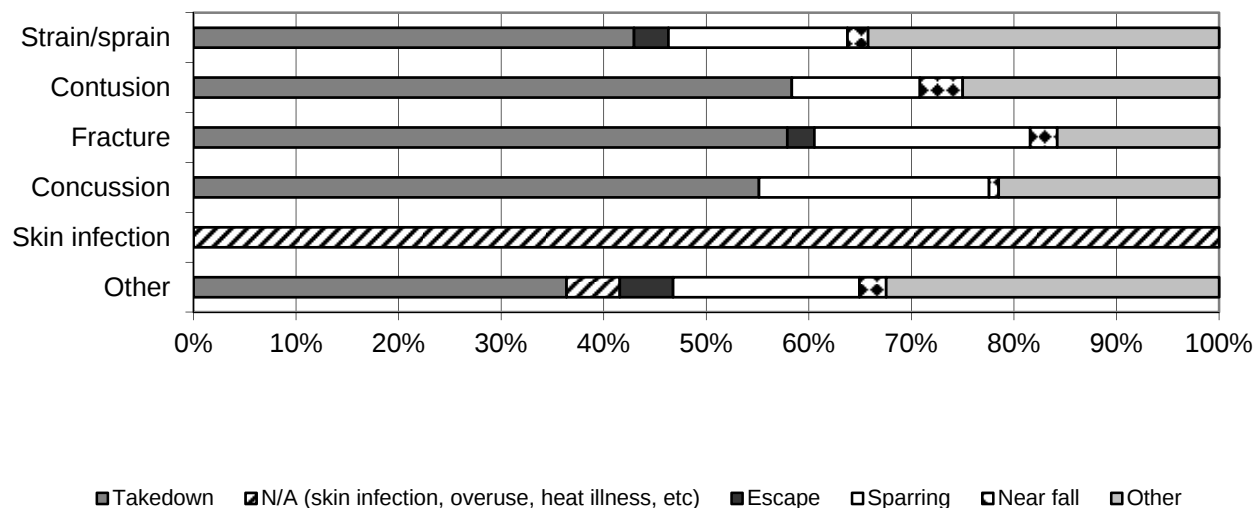
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 10.9 Activities Leading to Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                            | Competition |             | Practice   |             | Overall    |             |
|-------------------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                                     | n           | %           | n          | %           | n          | %           |
| Takedown                            | 96          | 53.6%       | 91         | 33.5%       | 187        | 41.5%       |
| Sparring                            | 21          | 11.7%       | 54         | 19.9%       | 75         | 16.6%       |
| N/A (skin infection, overuse, etc.) | 11          | 6.1%        | 49         | 18.0%       | 60         | 13.3%       |
| Fall                                | 9           | 5.0%        | 19         | 7.0%        | 28         | 6.2%        |
| Conditioning                        | ---         | 0.0%        | 20         | 7.4%        | 20         | 4.4%        |
| Near fall                           | 4           | 2.2%        | 4          | 1.5%        | 8          | 1.8%        |
| Escape                              | 7           | 3.9%        | 3          | 1.1%        | 10         | 2.2%        |
| Riding                              | 17          | 9.5%        | 7          | 2.6%        | 24         | 5.3%        |
| Reversal                            | 5           | 2.8%        | 8          | 2.9%        | 13         | 2.9%        |
| Other                               | 9           | 5.0%        | 17         | 6.3%        | 26         | 5.8%        |
| <b>Total</b>                        | <b>179</b>  | <b>100%</b> | <b>272</b> | <b>100%</b> | <b>451</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 10.4 Activities Resulting in Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XI. Baseball Injury Epidemiology**

**Table 11.1 Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>182</b> | <b>210,329</b> | <b>0.87</b>                                      |
| Competition  | 95         | 75,256         | 1.26                                             |
| Practice     | 87         | 135,073        | 0.64                                             |

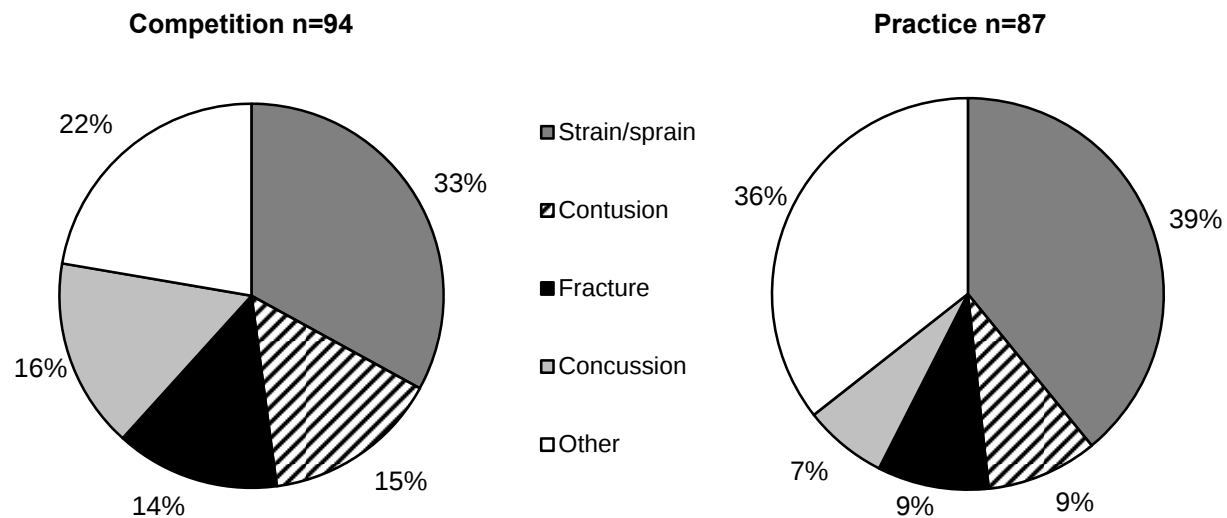
**Table 11.2 Demographic Characteristics of Injured Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=78</b> |
| Freshman                 | 23.6%       |
| Sophomore                | 21.9%       |
| Junior                   | 28.1%       |
| Senior                   | 26.4%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 14          |
| Maximum                  | 18          |
| Mean (St. Dev.)          | 16.2 (1.3)  |
| <b>BMI</b>               |             |
| Minimum                  | 13.7        |
| Maximum                  | 43.0        |
| Mean (St. Dev.)          | 24.4 (3.9)  |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 11.1 Diagnosis of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 11.3 Body Site of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

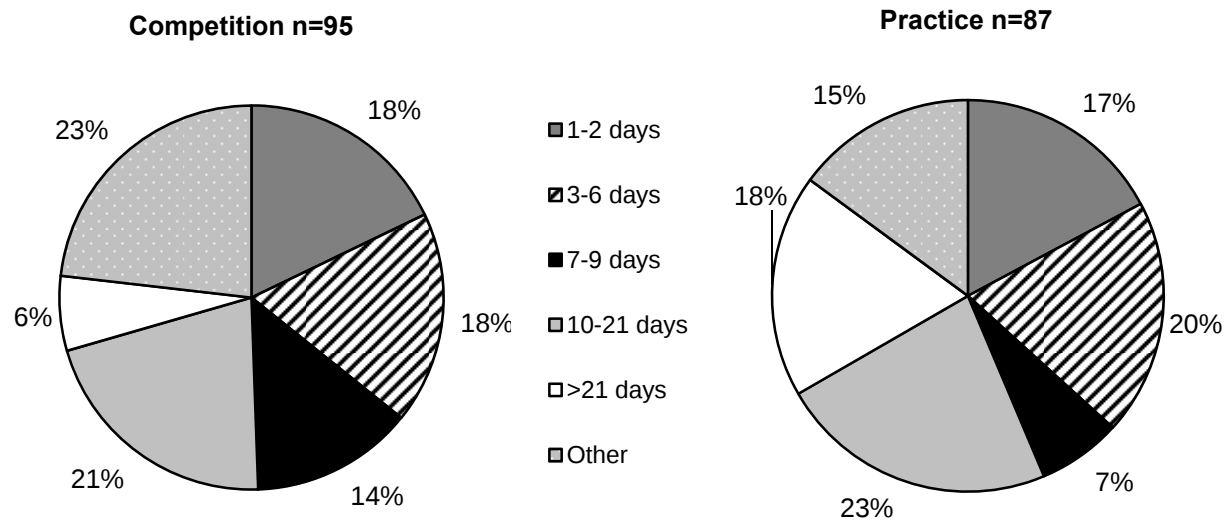
|                     | Competition |             | Practice  |             | Overall    |             |
|---------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                     | n           | %           | n         | %           | n          | %           |
| <b>Body Site</b>    |             |             |           |             |            |             |
| Head/face           | 25          | 26.3%       | 15        | 17.2%       | 40         | 22.0%       |
| Arm/elbow           | 16          | 16.8%       | 13        | 14.9%       | 29         | 15.9%       |
| Hand/wrist          | 13          | 13.7%       | 10        | 11.5%       | 23         | 12.6%       |
| Shoulder            | 5           | 5.3%        | 15        | 17.2%       | 20         | 11.0%       |
| Hip/thigh/upper leg | 12          | 12.6%       | 6         | 6.9%        | 18         | 9.9%        |
| Ankle               | 7           | 7.4%        | 8         | 9.2%        | 15         | 8.2%        |
| Trunk               | 4           | 4.2%        | 9         | 10.3%       | 13         | 7.1%        |
| Knee                | 5           | 5.3%        | 6         | 6.9%        | 11         | 6.0%        |
| Lower leg           | 5           | 5.3%        | 1         | 1.1%        | 6          | 3.3%        |
| Foot                | 2           | 2.1%        | 2         | 2.3%        | 4          | 2.2%        |
| Neck                | ---         | 0.0%        | 2         | 2.3%        | 2          | 1.1%        |
| Other               | 1           | 1.1%        | ---       | 0.0%        | 1          | 0.5%        |
| <b>Total</b>        | <b>95</b>   | <b>100%</b> | <b>87</b> | <b>100%</b> | <b>182</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 11.4 Ten Most Common Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=94 |       | Practice<br>n=87 |      | Total<br>n=181 |       |
|-----------------------------------|---------------------|-------|------------------|------|----------------|-------|
|                                   | n                   | %     | n                | %    | n              | %     |
| Head/face concussion              | 15                  | 16.0% | 6                | 6.9% | 21             | 11.6% |
| Hip/thigh/upper leg strain/sprain | 11                  | 11.7% | 6                | 6.9% | 17             | 9.4%  |
| Ankle strain/sprain               | 7                   | 7.4%  | 7                | 8.0% | 14             | 7.7%  |
| Shoulder other                    | 4                   | 4.3%  | 8                | 9.2% | 12             | 6.6%  |
| Hand/wrist fracture               | 8                   | 8.5%  | 3                | 3.4% | 11             | 6.1%  |
| Arm/elbow strain/sprain           | 4                   | 4.3%  | 4                | 4.6% | 8              | 4.4%  |
| Shoulder strain/sprain            | 1                   | 1.1%  | 7                | 8.0% | 8              | 4.4%  |
| Head/face fracture                | 4                   | 4.3%  | 3                | 3.4% | 7              | 3.9%  |
| Knee other                        | 2                   | 2.1%  | 4                | 4.6% | 6              | 3.3%  |
| Trunk strain/sprain               | 2                   | 2.1%  | 4                | 4.6% | 6              | 3.3%  |

**Figure 11.2 Time Loss of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



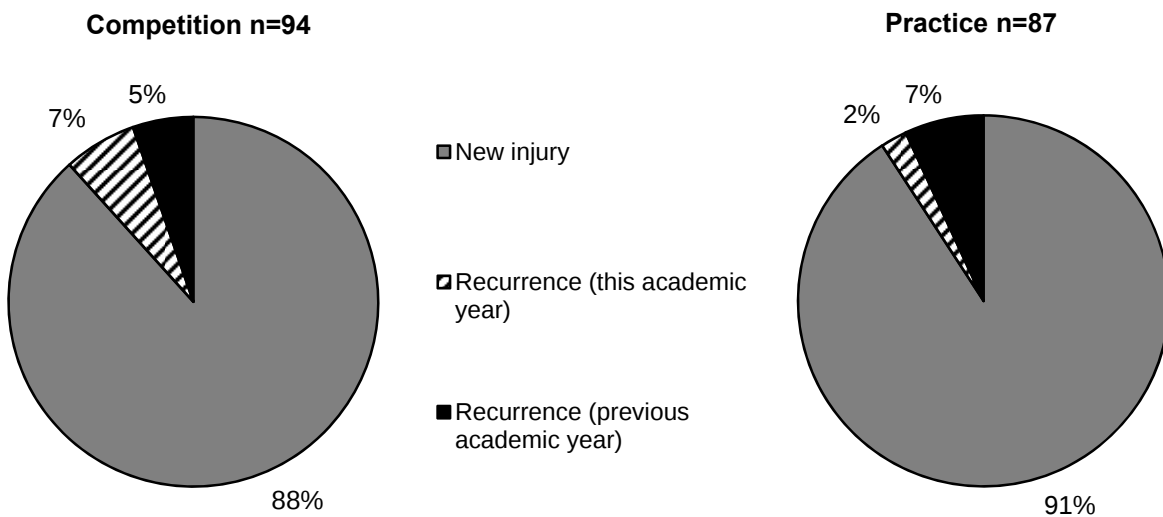
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 11.5 Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall    |             |
|-------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                         | n           | %           | n         | %           | n          | %           |
| <b>Need for surgery</b> |             |             |           |             |            |             |
| Required surgery        | 7           | 7.6%        | 9         | 10.6%       | 16         | 9.0%        |
| Did not require surgery | 86          | 92.4%       | 76        | 89.4%       | 162        | 91.0%       |
| <b>Total</b>            | <b>93</b>   | <b>100%</b> | <b>85</b> | <b>100%</b> | <b>178</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 11.3 History of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 11.6 Time during Season of Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 44         | 24.2%       |
| Regular season        | 132        | 72.5%       |
| Post season           | 6          | 3.3%        |
| <b>Total</b>          | <b>182</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 11.7 Competition-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | <b>n</b>  | <b>%</b>    |
|----------------------------|-----------|-------------|
| <b>Time in Competition</b> |           |             |
| Pre-competition/warm-ups   | 7         | 7.6%        |
| First inning               | 6         | 6.5%        |
| Second inning              | 9         | 9.8%        |
| Third inning               | 15        | 16.3%       |
| Fourth inning              | 23        | 25.0%       |
| Fifth inning               | 17        | 18.5%       |
| Sixth inning               | 6         | 6.5%        |
| Seventh inning             | 8         | 8.7%        |
| Extra innings              | 1         | 1.1%        |
| <b>Total</b>               | <b>92</b> | <b>100%</b> |
| <b>Field Location</b>      |           |             |
| Home plate                 | 20        | 21.3%       |
| First base                 | 12        | 12.8%       |
| Second base                | 9         | 9.6%        |
| Third base                 | 9         | 9.6%        |
| Infield                    | 8         | 8.5%        |
| Pitcher's mound            | 17        | 18.1%       |
| Outfield                   | 12        | 12.8%       |
| Foul territory             | 3         | 3.2%        |
| Other                      | 4         | 4.3%        |
| <b>Total</b>               | <b>94</b> | <b>100%</b> |

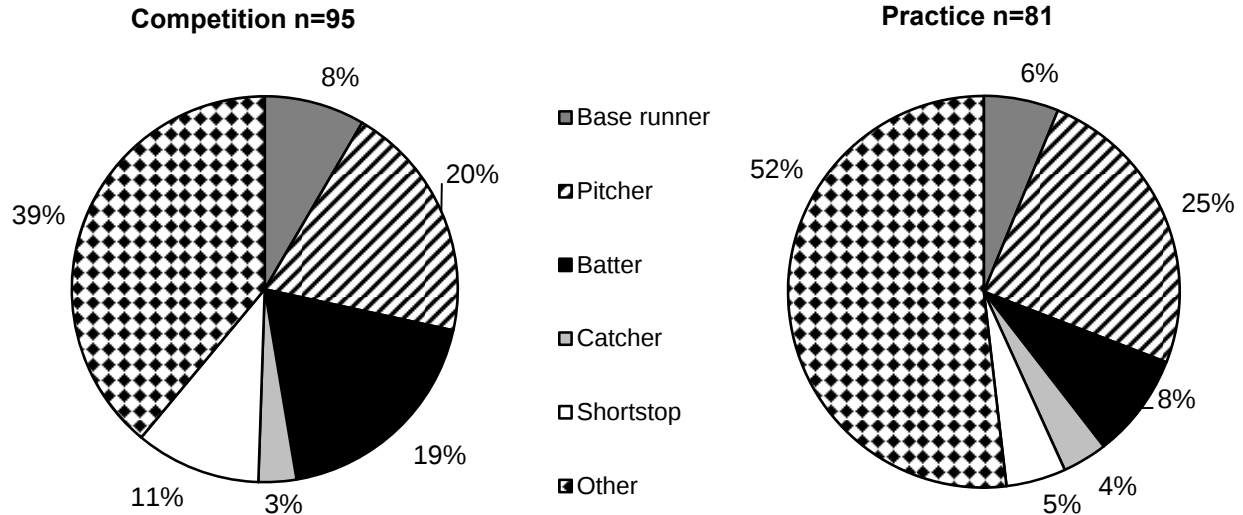
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 11.8 Practice-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 9         | 11.4%       |
| Second 1/2 hour         | 15        | 19.0%       |
| 1-2 hours into practice | 44        | 55.7%       |
| >2 hours into practice  | 11        | 13.9%       |
| <b>Total</b>            | <b>79</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 11.4 Player Position of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

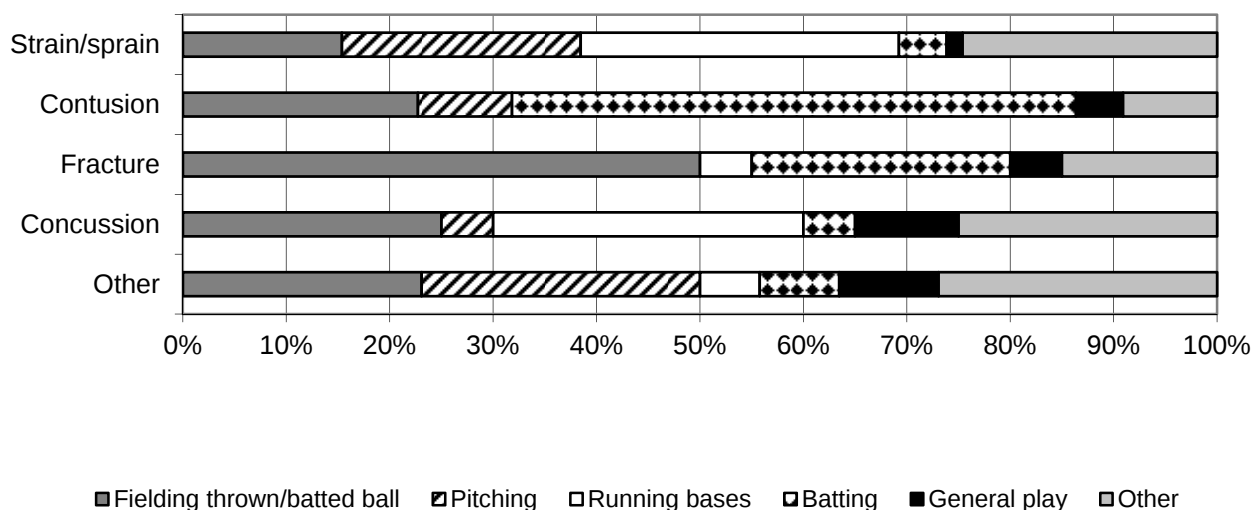


**Table 11.9 Activities Leading to Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                | Competition |             | Practice  |             | Overall    |             |
|-------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                         | n           | %           | n         | %           | n          | %           |
| Pitching                | 17          | 17.9%       | 15        | 17.6%       | 32         | 17.8%       |
| Fielding a batted ball  | 17          | 17.9%       | 14        | 16.5%       | 31         | 17.2%       |
| Running bases           | 18          | 18.9%       | 12        | 14.1%       | 30         | 16.7%       |
| Batting                 | 16          | 16.8%       | 9         | 10.6%       | 25         | 13.9%       |
| Throwing (not pitching) | 4           | 4.2%        | 13        | 15.3%       | 17         | 9.4%        |
| Fielding a thrown ball  | 6           | 6.3%        | 5         | 5.9%        | 11         | 6.1%        |
| General play            | 4           | 4.2%        | 6         | 7.1%        | 10         | 5.6%        |
| Sliding                 | 5           | 5.3%        | 2         | 2.4%        | 7          | 3.9%        |
| Catching                | 3           | 3.2%        | 3         | 3.5%        | 6          | 3.3%        |
| Conditioning            | 1           | 1.1%        | 3         | 3.5%        | 4          | 2.2%        |
| Other                   | 4           | 4.2%        | 3         | 3.5%        | 7          | 3.9%        |
| <b>Total</b>            | <b>95</b>   | <b>100%</b> | <b>85</b> | <b>100%</b> | <b>180</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 11.5 Activity Resulting in Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XII. Softball Injury Epidemiology**

**Table 12.1 Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>239</b> | <b>153,672</b> | <b>1.56</b>                                      |
| Competition  | 123        | 53,533         | 2.30                                             |
| Practice     | 116        | 100,139        | 1.16                                             |

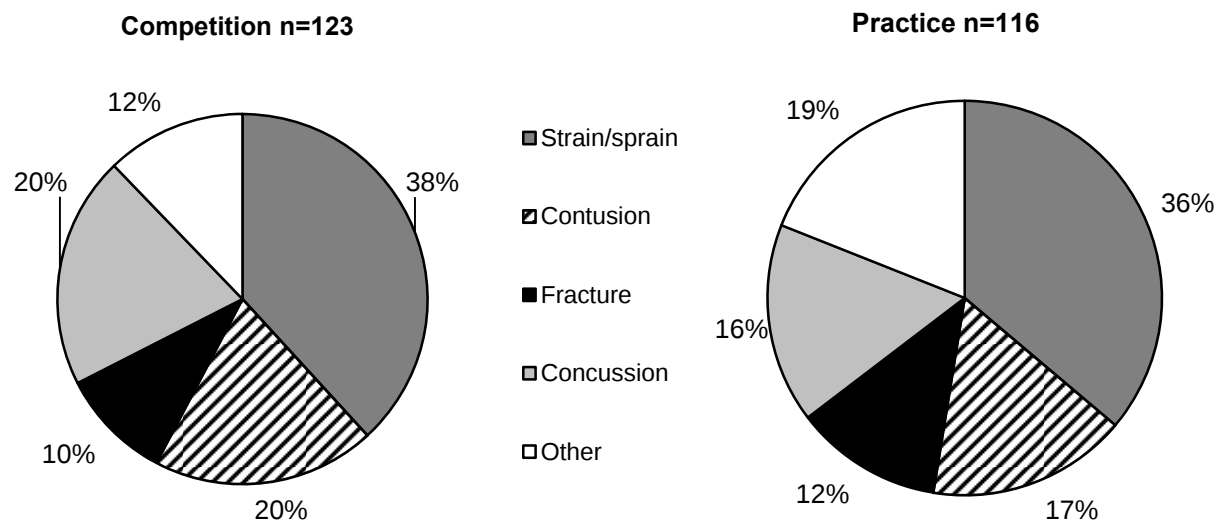
**Table 12.2 Demographic Characteristics of Injured Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                       |              |
|-----------------------|--------------|
| <b>Year in School</b> | <b>n=236</b> |
| Freshman              | 33.1%        |
| Sophomore             | 28.4%        |
| Junior                | 24.6%        |
| Senior                | 14.0%        |
| <b>Total†</b>         | <b>100%</b>  |
| <b>Age (years)</b>    |              |
| Minimum               | 13           |
| Maximum               | 19           |
| Mean (St. Dev.)       | 15.6 (1.2)   |
| <b>BMI</b>            |              |
| Minimum               | 17.6         |
| Maximum               | 42.0         |
| Mean (St. Dev.)       | 23.2 (3.7)   |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 12.1 Diagnosis of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 12.3 Body Site of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

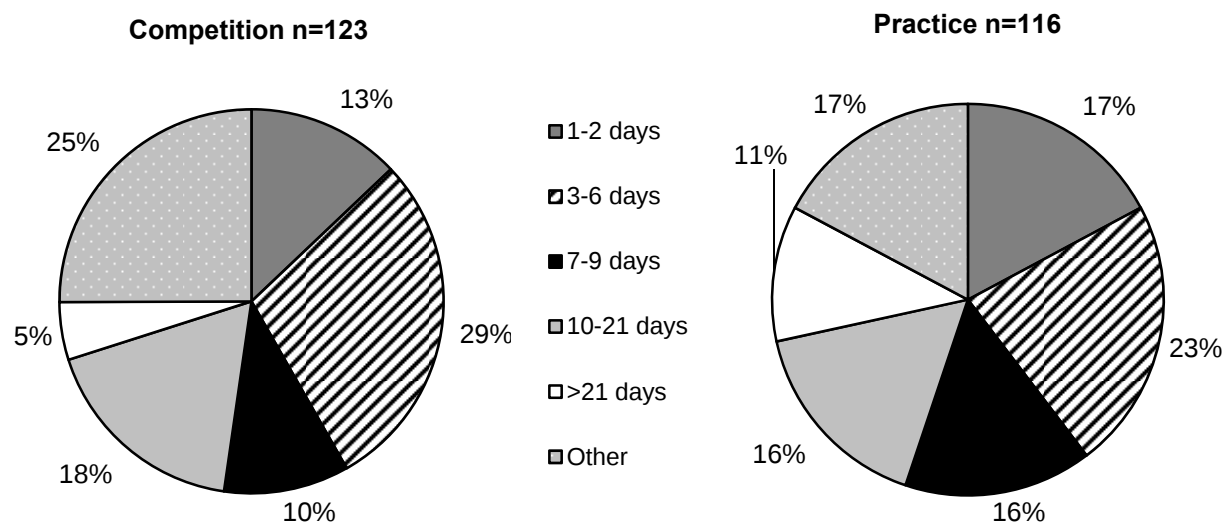
|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Head/face           | 32          | 26.0%       | 32         | 27.6%       | 64         | 26.8%       |
| Ankle               | 20          | 16.3%       | 15         | 12.9%       | 35         | 14.6%       |
| Knee                | 16          | 13.0%       | 14         | 12.1%       | 30         | 12.6%       |
| Hand/wrist          | 15          | 12.2%       | 14         | 12.1%       | 29         | 12.1%       |
| Shoulder            | 10          | 8.1%        | 11         | 9.5%        | 21         | 8.8%        |
| Hip/thigh/upper leg | 9           | 7.3%        | 11         | 9.5%        | 20         | 8.4%        |
| Lower leg           | 7           | 5.7%        | 5          | 4.3%        | 12         | 5.0%        |
| Arm/elbow           | 7           | 5.7%        | 4          | 3.4%        | 11         | 4.6%        |
| Trunk               | 2           | 1.6%        | 7          | 6.0%        | 9          | 3.8%        |
| Foot                | 2           | 1.6%        | 1          | 0.9%        | 3          | 1.3%        |
| Neck                | 2           | 1.6%        | 1          | 0.9%        | 3          | 1.3%        |
| Other               | 1           | 0.8%        | 1          | 0.9%        | 2          | 0.8%        |
| <b>Total</b>        | <b>123</b>  | <b>100%</b> | <b>116</b> | <b>100%</b> | <b>239</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 12.4 Ten Most Common Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=123 |       | Practice<br>n=116 |       | Total<br>n=239 |       |
|-----------------------------------|----------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                    | %     | n                 | %     | n              | %     |
| Head/face concussion              | 25                   | 20.3% | 19                | 16.4% | 44             | 18.4% |
| Ankle strain/sprain               | 17                   | 13.8% | 11                | 9.5%  | 28             | 11.7% |
| Knee strain/sprain                | 10                   | 8.1%  | 6                 | 5.2%  | 16             | 6.7%  |
| Hand/wrist fracture               | 7                    | 5.7%  | 8                 | 6.9%  | 15             | 6.3%  |
| Hip/thigh/upper leg strain/sprain | 5                    | 4.1%  | 9                 | 7.8%  | 14             | 5.9%  |
| Shoulder other                    | 3                    | 2.4%  | 6                 | 5.2%  | 9              | 3.8%  |
| Hand/wrist contusion              | 5                    | 4.1%  | 4                 | 3.4%  | 9              | 3.8%  |
| Shoulder strain/sprain            | 4                    | 3.3%  | 5                 | 4.3%  | 9              | 3.8%  |
| Arm/elbow strain/sprain           | 4                    | 3.3%  | 2                 | 1.7%  | 6              | 2.5%  |
| Trunk strain/sprain               | ---                  | 0.0%  | 5                 | 4.3%  | 5              | 2.1%  |

**Figure 12.2 Time Loss of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



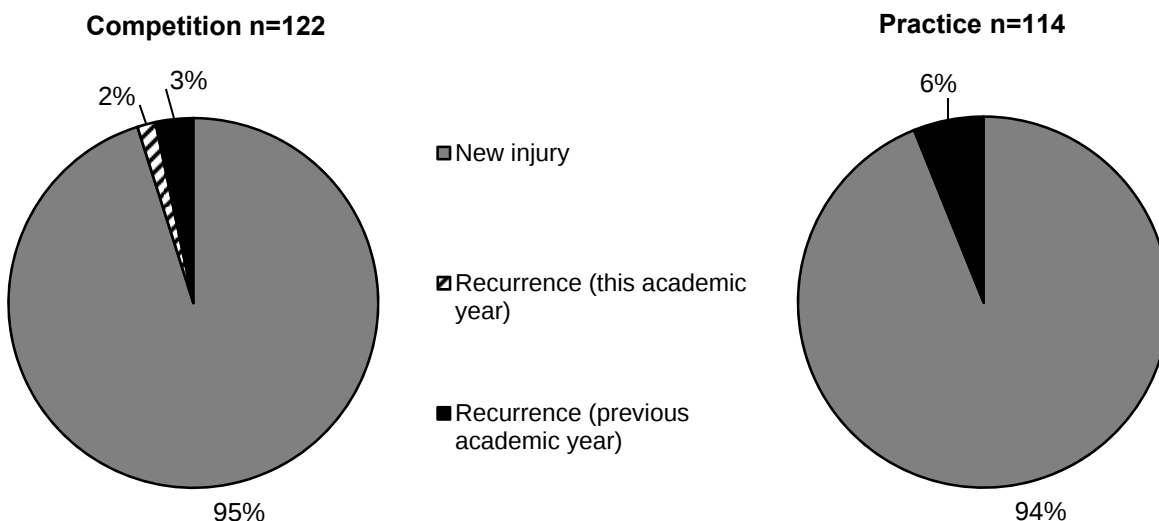
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 12.5 Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 9           | 7.5%        | 7          | 6.0%        | 16         | 6.8%        |
| Did not require surgery | 111         | 92.5%       | 109        | 94.0%       | 220        | 93.2%       |
| <b>Total</b>            | <b>120</b>  | <b>100%</b> | <b>116</b> | <b>100%</b> | <b>236</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 12.3 History of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 12.6 Time during Season of Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 55         | 23.1%       |
| Regular season        | 177        | 74.4%       |
| Post season           | 6          | 2.5%        |
| <b>Total</b>          | <b>238</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 12.7 Competition-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | <b>n</b>   | <b>%</b>    |
|----------------------------|------------|-------------|
| <b>Time in Competition</b> |            |             |
| Pre-competition/warm-ups   | 10         | 8.8%        |
| First inning               | 3          | 2.7%        |
| Second inning              | 6          | 5.3%        |
| Third inning               | 24         | 21.2%       |
| Fourth inning              | 34         | 30.1%       |
| Fifth inning               | 22         | 19.5%       |
| Sixth inning               | 8          | 7.1%        |
| Seventh inning             | 5          | 4.4%        |
| Extra innings              | 1          | 0.9%        |
| <b>Total</b>               | <b>113</b> | <b>100%</b> |
| <b>Field Location</b>      |            |             |
| Home plate                 | 29         | 24.0%       |
| Second base                | 20         | 16.5%       |
| Third base                 | 17         | 14.0%       |
| First base                 | 12         | 9.9%        |
| Pitcher's mound            | 12         | 9.9%        |
| Outfield                   | 11         | 9.1%        |
| Infield                    | 10         | 8.3%        |
| Foul territory             | 6          | 5.0%        |
| Other                      | 4          | 3.3%        |
| <b>Total</b>               | <b>121</b> | <b>100%</b> |

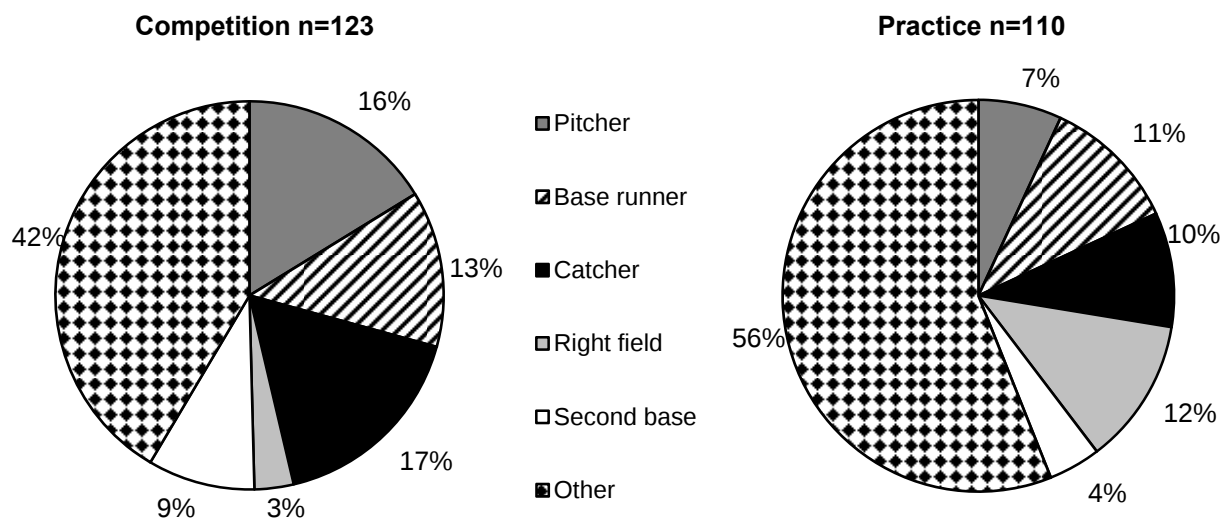
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 12.8 Practice-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 22         | 20.6%       |
| Second 1/2 hour         | 19         | 17.8%       |
| 1-2 hours into practice | 60         | 56.1%       |
| >2 hours into practice  | 6          | 5.6%        |
| <b>Total</b>            | <b>107</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 12.4 Player Position of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

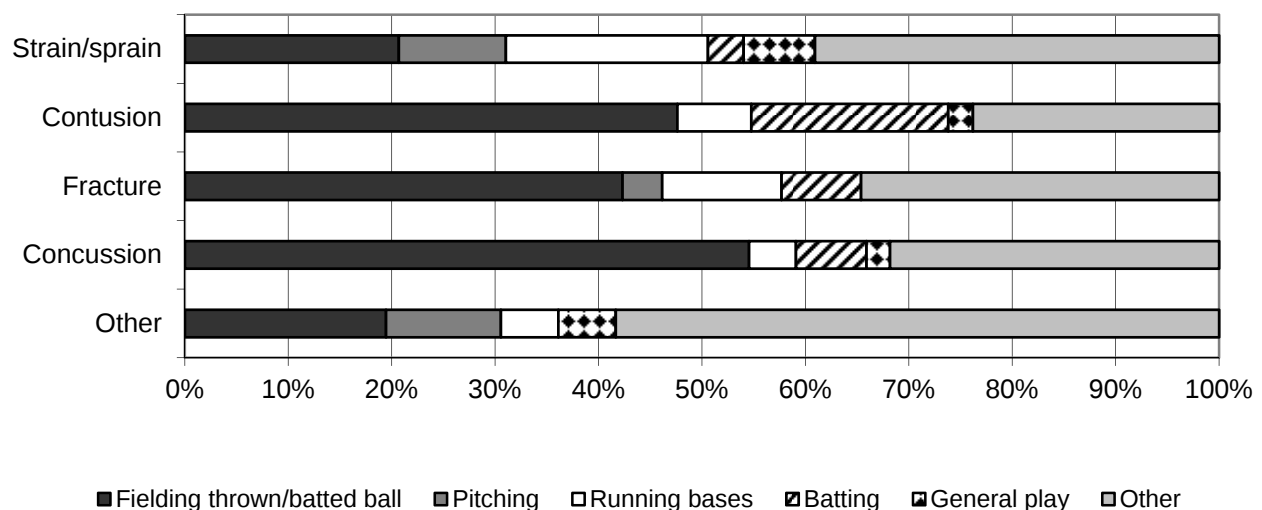


**Table 12.9 Activities Leading to Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| Fielding a batted ball  | 30          | 24.6%       | 35         | 31.0%       | 65         | 27.7%       |
| Sliding                 | 20          | 16.4%       | 10         | 8.8%        | 30         | 12.8%       |
| Running bases           | 18          | 14.8%       | 9          | 8.0%        | 27         | 11.5%       |
| Catching                | 10          | 8.2%        | 10         | 8.8%        | 20         | 8.5%        |
| Throwing (not pitching) | 3           | 2.5%        | 14         | 12.4%       | 17         | 7.2%        |
| Batting                 | 13          | 10.7%       | 3          | 2.7%        | 16         | 6.8%        |
| Fielding a thrown ball  | 4           | 3.3%        | 11         | 9.7%        | 15         | 6.4%        |
| Pitching                | 10          | 8.2%        | 4          | 3.5%        | 14         | 6.0%        |
| General play            | 6           | 4.9%        | 4          | 3.5%        | 10         | 4.3%        |
| Conditioning            | ---         | 0.0%        | 8          | 7.1%        | 8          | 3.4%        |
| Other                   | 8           | 6.6%        | 5          | 4.4%        | 13         | 5.5%        |
| <b>Total</b>            | <b>122</b>  | <b>100%</b> | <b>113</b> | <b>100%</b> | <b>235</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 12.5 Activity Resulting in Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



### **XIII. Girls' Field Hockey Injury Epidemiology**

**Table 13.1 Girls' Field Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|---------------|----------------------------------------------|
| <b>Total</b> | <b>134</b> | <b>75,740</b> | <b>1.77</b>                                  |
| Competition  | 58         | 23,169        | 2.50                                         |
| Practice     | 76         | 52,571        | 1.45                                         |

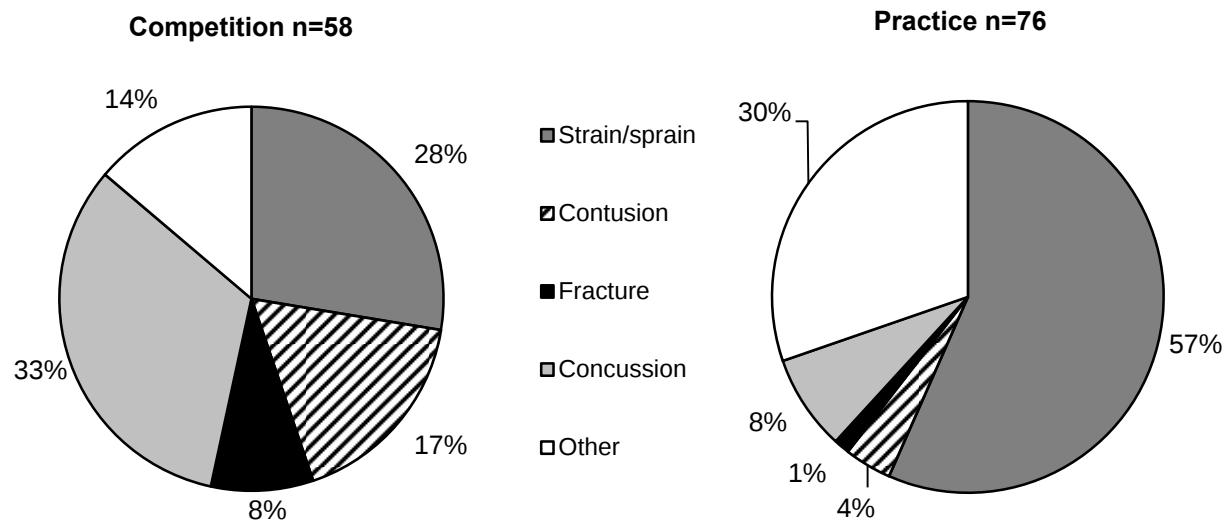
**Table 13.2 Demographic Characteristics of Injured Girls' Field Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=131</b> |
| Freshman                 | 21.4%        |
| Sophomore                | 26.0%        |
| Junior                   | 26.0%        |
| Senior                   | 26.7%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 18           |
| Mean (St. Dev.)          | 15.6 (1.3)   |
| <b>BMI</b>               |              |
| Minimum                  | 17.2         |
| Maximum                  | 39.7         |
| Mean (St. Dev.)          | 22.5 (3.1)   |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 13.1 Diagnosis of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 13.3 Body Site of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

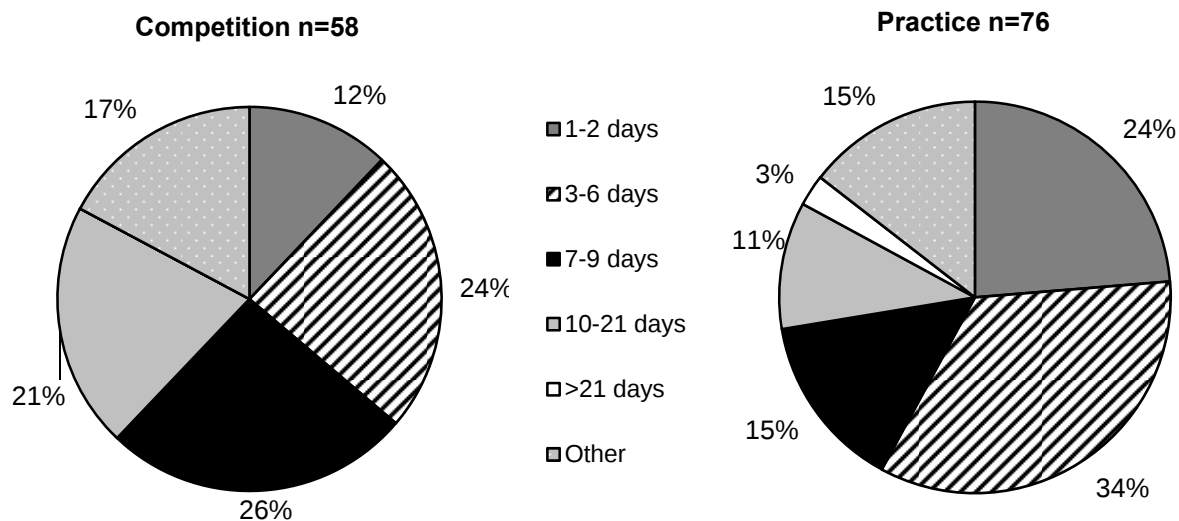
|                     | Competition |             | Practice  |             | Overall    |             |
|---------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                     | n           | %           | n         | %           | n          | %           |
| <b>Body Site</b>    |             |             |           |             |            |             |
| Head/face           | 23          | 39.7%       | 11        | 14.5%       | 34         | 25.4%       |
| Hip/thigh/upper leg | 7           | 12.1%       | 21        | 27.6%       | 28         | 20.9%       |
| Knee                | 6           | 10.3%       | 11        | 14.5%       | 17         | 12.7%       |
| Ankle               | 3           | 5.2%        | 11        | 14.5%       | 14         | 10.4%       |
| Hand/wrist          | 11          | 19.0%       | 2         | 2.6%        | 13         | 9.7%        |
| Foot                | 4           | 6.9%        | 5         | 6.6%        | 9          | 6.7%        |
| Lower leg           | ---         | 0.0%        | 7         | 9.2%        | 7          | 5.2%        |
| Trunk               | ---         | 0.0%        | 3         | 3.9%        | 3          | 2.2%        |
| Shoulder            | 2           | 3.4%        | 1         | 1.3%        | 3          | 2.2%        |
| Neck                | 1           | 1.7%        | 1         | 1.3%        | 2          | 1.5%        |
| Other               | 1           | 1.7%        | 3         | 3.9%        | 4          | 3.0%        |
| <b>Total</b>        | <b>58</b>   | <b>100%</b> | <b>76</b> | <b>100%</b> | <b>134</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 13.4 Ten Most Common Girls' Field Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 201-12 School Year**

|                                   | Competition<br>n=58 |       | Practice<br>n=76 |       | Total<br>n=134 |       |
|-----------------------------------|---------------------|-------|------------------|-------|----------------|-------|
|                                   | n                   | %     | n                | %     | n              | %     |
| <b>Diagnosis</b>                  |                     |       |                  |       |                |       |
| Hip/thigh/upper leg strain/sprain | 7                   | 12.1% | 20               | 26.3% | 27             | 20.1% |
| Head/face concussion              | 19                  | 32.8% | 6                | 7.9%  | 25             | 18.7% |
| Ankle strain/sprain               | 3                   | 5.2%  | 10               | 13.2% | 13             | 9.7%  |
| Knee strain/sprain                | 3                   | 5.2%  | 6                | 7.9%  | 9              | 6.7%  |
| Head/face other                   | 3                   | 5.2%  | 4                | 5.3%  | 7              | 5.2%  |
| Knee other                        | 2                   | 3.4%  | 4                | 5.3%  | 6              | 4.5%  |
| Hand/wrist fracture               | 5                   | 8.6%  | 1                | 1.3%  | 6              | 4.5%  |
| Lower leg other                   | ---                 | 0.0%  | 5                | 6.6%  | 5              | 3.7%  |
| Hand/wrist contusion              | 4                   | 6.9%  | ---              | 0.0%  | 4              | 3.0%  |
| Foot other                        | 1                   | 1.7%  | 3                | 3.9%  | 4              | 3.0%  |
| Foot contusion                    | 3                   | 5.2%  | ---              | 0.0%  | 3              | 2.2%  |

**Figure 13.2 Time Loss of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



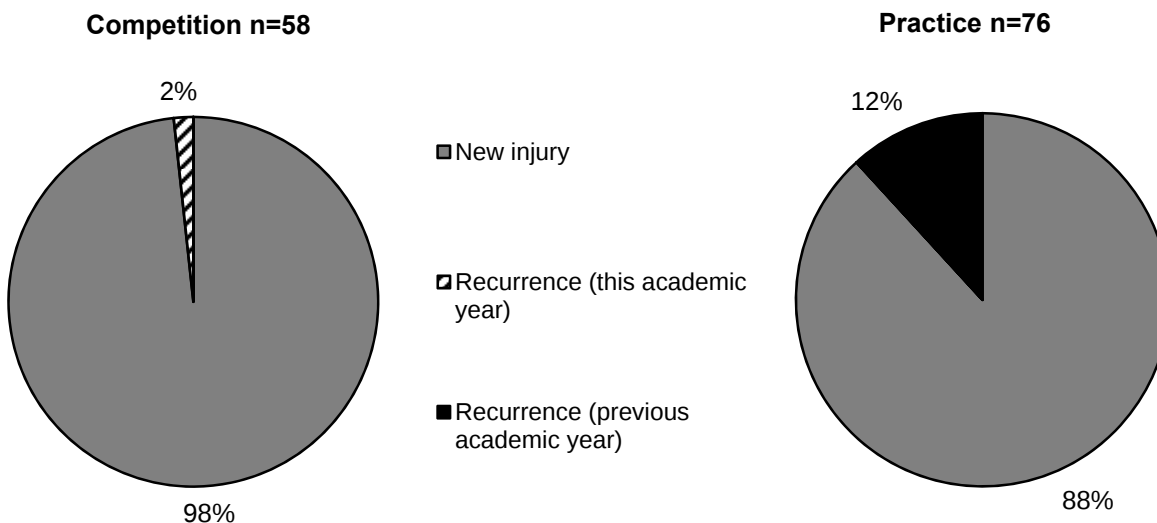
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 13.5 Girls' Field Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall    |             |
|-------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                         | n           | %           | n         | %           | n          | %           |
| <b>Need for surgery</b> |             |             |           |             |            |             |
| Required surgery        | 2           | 3.5%        | 4         | 5.3%        | 6          | 4.5%        |
| Did not require surgery | 55          | 96.5%       | 71        | 94.7%       | 126        | 95.5%       |
| <b>Total</b>            | <b>57</b>   | <b>100%</b> | <b>75</b> | <b>100%</b> | <b>132</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 13.3 History of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 13.6 Time during Season of Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 40         | 30.1%       |
| Regular season        | 89         | 66.9%       |
| Post season           | 4          | 3.0%        |
| <b>Total</b>          | <b>133</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 13.7 Competition-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                      | n         | %           |
|--------------------------------------|-----------|-------------|
| <b>Time in Competition</b>           |           |             |
| Pre-competition/warm-ups             | 3         | 5.4%        |
| First half                           | 9         | 16.1%       |
| Second half                          | 44        | 78.6%       |
| Overtime                             | ---       | 0.0%        |
| <b>Total</b>                         | <b>56</b> | <b>100%</b> |
| <b>Field Location</b>                |           |             |
| Between 25-yard line and center line | 19        | 36.5%       |
| Goal area/circle                     | 14        | 26.9%       |
| Within 25-yard line                  | 8         | 15.4%       |
| Within 16-yard arc                   | 6         | 11.5%       |
| Sideline                             | 4         | 7.7%        |
| Other                                | 1         | 1.9%        |
| <b>Total</b>                         | <b>52</b> | <b>100%</b> |

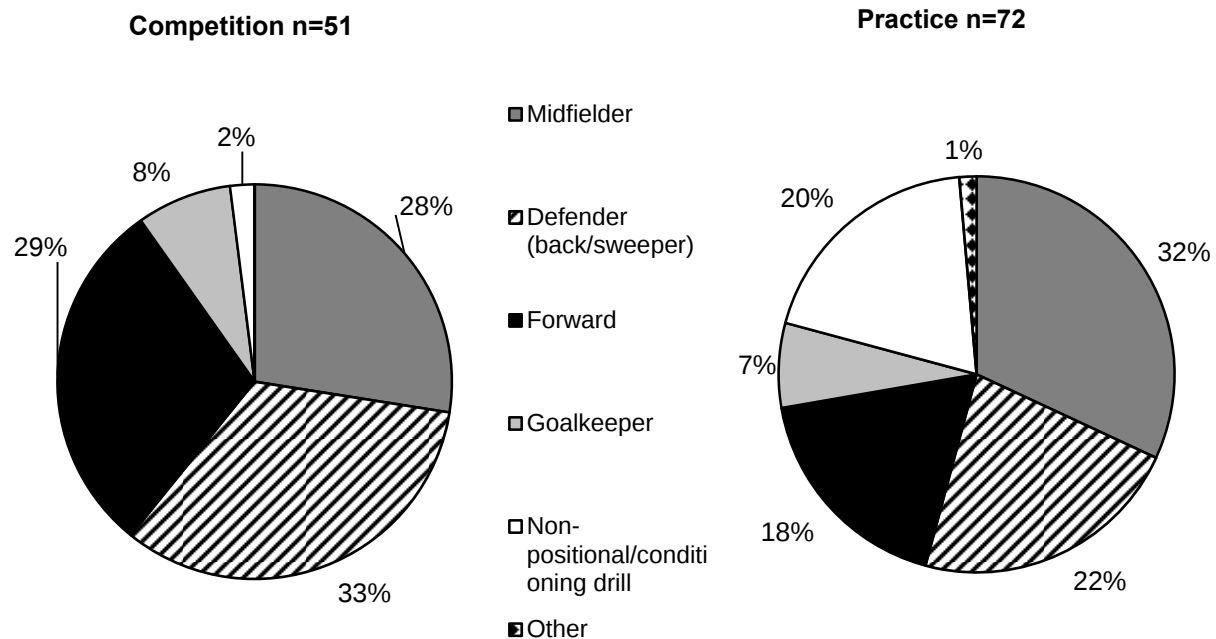
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 13.8 Practice-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 11        | 15.5%       |
| Second 1/2 hour         | 21        | 29.6%       |
| 1-2 hours into practice | 31        | 43.7%       |
| >2 hours into practice  | 8         | 11.3%       |
| <b>Total</b>            | <b>71</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 13.4 Player Position of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

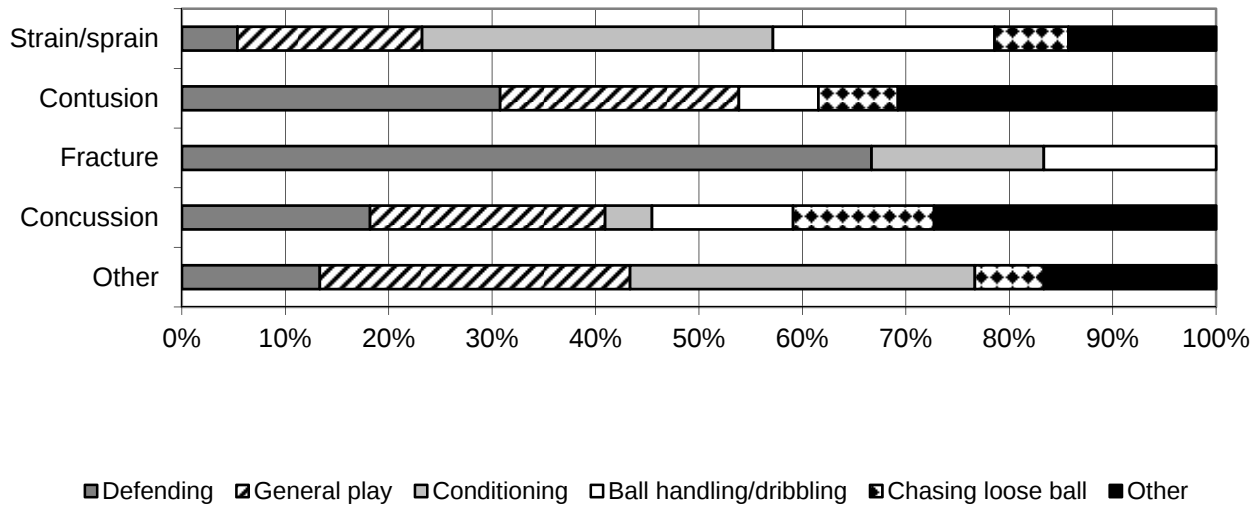


**Table 13.9 Activities Leading to Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                | Competition |             | Practice  |             | Overall    |             |
|-------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                         | n           | %           | n         | %           | n          | %           |
| Conditioning            | ---         | 0.0%        | 31        | 42.5%       | 31         | 24.4%       |
| General play            | 12          | 22.2%       | 15        | 20.5%       | 27         | 21.3%       |
| Defending               | 16          | 29.6%       | 3         | 4.1%        | 19         | 15.0%       |
| Ball handling/dribbling | 9           | 16.7%       | 8         | 11.0%       | 17         | 13.4%       |
| Chasing a loose ball    | 5           | 9.3%        | 5         | 6.8%        | 10         | 7.9%        |
| Goaltending             | 4           | 7.4%        | 3         | 4.1%        | 7          | 5.5%        |
| Shooting                | 3           | 5.6%        | 2         | 2.7%        | 5          | 3.9%        |
| Receiving pass          | 2           | 3.7%        | 2         | 2.7%        | 4          | 3.1%        |
| Passing                 | ---         | 0.0%        | 2         | 2.7%        | 2          | 1.6%        |
| Blocking shot           | 1           | 1.9%        | 1         | 1.4%        | 2          | 1.6%        |
| Penalty corner          | 1           | 1.9%        | ---       | 0.0%        | 1          | 0.8%        |
| Other                   | 1           | 1.9%        | 1         | 1.4%        | 2          | 1.6%        |
| <b>Total</b>            | <b>54</b>   | <b>100%</b> | <b>73</b> | <b>100%</b> | <b>127</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 13.5 Activity Resulting in Girls' Field Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



#### **XIV. Girls' Gymnastics Injury Epidemiology**

**Table 14.1 Girls' Gymnastics Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|---------------|----------------------------------------------|
| <b>Total</b> | <b>21</b>  | <b>19,246</b> | <b>1.09</b>                                  |
| Competition  | 6          | 3,278         | 1.83                                         |
| Practice     | 15         | 15,968        | 0.94                                         |

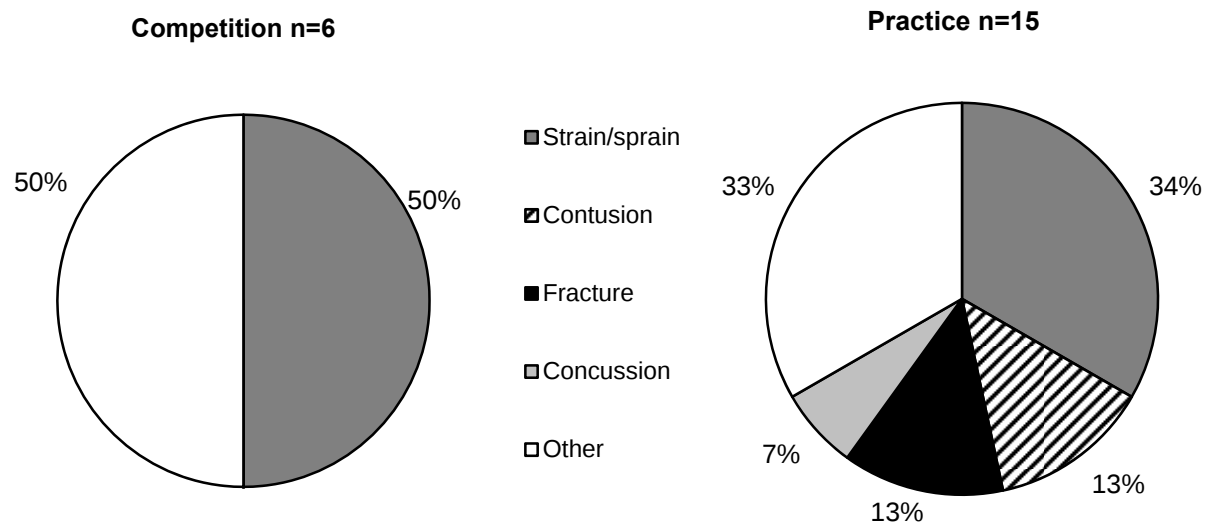
**Table 14.2 Demographic Characteristics of Injured Girls' Gymnastics Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=19</b> |
| Freshman                 | 31.6%       |
| Sophomore                | 31.6%       |
| Junior                   | 21.1%       |
| Senior                   | 15.8%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 13          |
| Maximum                  | 18          |
| Mean (St. Dev.)          | 15.1 (1.4)  |
| <b>BMI</b>               |             |
| Minimum                  | 17.5        |
| Maximum                  | 25.2        |
| Mean (St. Dev.)          | 21.0 (2.1)  |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 14.1 Diagnosis of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 14.3 Body Site of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

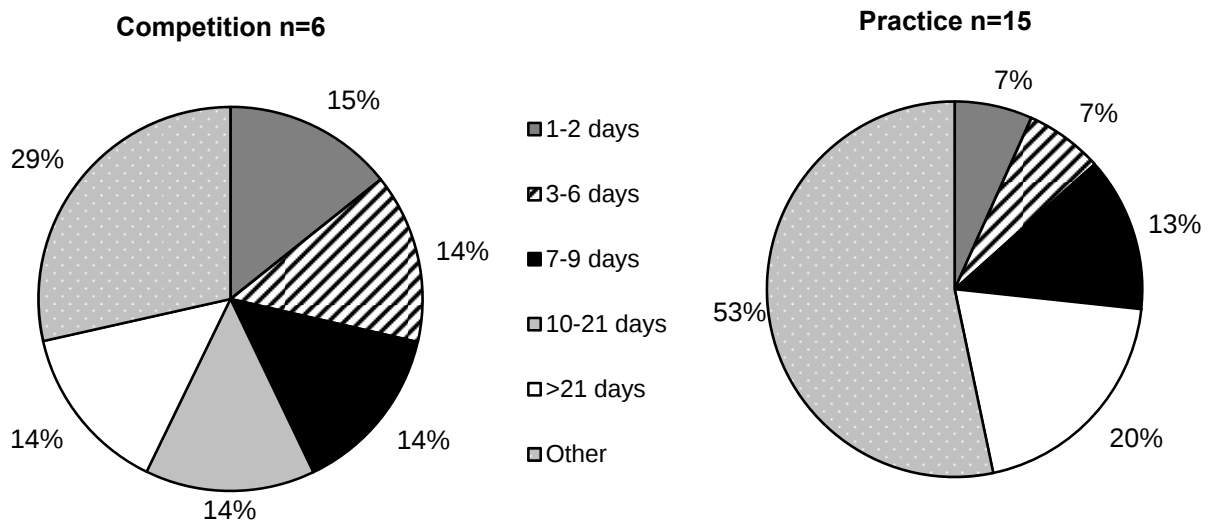
|                  | Competition |             | Practice  |             | Overall   |             |
|------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                  | n           | %           | n         | %           | n         | %           |
| <b>Body Site</b> |             |             |           |             |           |             |
| Trunk            | 3           | 50.0%       | 4         | 26.7%       | 7         | 33.3%       |
| Ankle            | ---         | 0.0%        | 4         | 26.7%       | 4         | 19.0%       |
| Knee             | 2           | 33.3%       | 2         | 13.3%       | 4         | 19.0%       |
| Arm/elbow        | ---         | 0.0%        | 3         | 20.0%       | 3         | 14.3%       |
| Head/face        | ---         | 0.0%        | 1         | 6.7%        | 1         | 4.8%        |
| Lower leg        | 1           | 16.7%       | ---       | 0.0%        | 1         | 4.8%        |
| Foot             | ---         | 0.0%        | 1         | 6.7%        | 1         | 4.8%        |
| Shoulder         | ---         | 0.0%        | ---       | 0.0%        | ---       | 0.0%        |
| <b>Total</b>     | <b>6</b>    | <b>100%</b> | <b>15</b> | <b>100%</b> | <b>21</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 14.4 Ten Most Common Girls' Gymnastics Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis            | Competition<br>n=6 |       | Practice<br>n=15 |       | Total<br>n=21 |       |
|----------------------|--------------------|-------|------------------|-------|---------------|-------|
|                      | n                  | %     | n                | %     | n             | %     |
| Trunk other          | 2                  | 33.3% | 2                | 13.3% | 4             | 19.0% |
| Ankle strain/sprain  | ---                | 0.0%  | 3                | 20.0% | 3             | 14.3% |
| Trunk strain/sprain  | 1                  | 16.7% | 2                | 13.3% | 3             | 14.3% |
| Knee strain/sprain   | 2                  | 22.3% | ---              | 0.0%  | 2             | 9.5%  |
| Knee other           | ---                | 0.0%  | 2                | 13.3% | 2             | 9.5%  |
| Head/face concussion | ---                | 0.0%  | 1                | 6.7%  | 1             | 4.8%  |
| Ankle fracture       | ---                | 0.0%  | 1                | 6.7%  | 1             | 4.8%  |
| Lower leg other      | 1                  | 16.7% | ---              | 0.0%  | 1             | 4.8%  |
| Foot contusion       | ---                | 0.0%  | 1                | 6.7%  | 1             | 4.8%  |
| Arm/elbow fracture   | ---                | 0.0%  | 1                | 6.7%  | 1             | 4.8%  |

**Figure 14.2 Time Loss of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



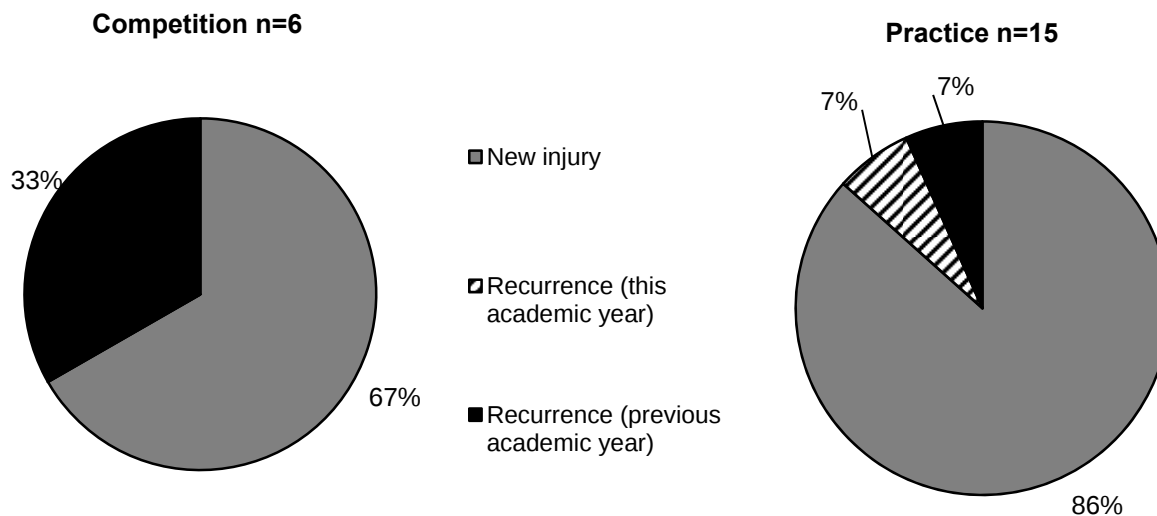
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 14.5 Girls' Gymnastics Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |           |             |
| Required surgery        | 1           | 16.7%       | 1         | 6.7%        | 2         | 9.5%        |
| Did not require surgery | 5           | 83.3%       | 14        | 93.3%       | 19        | 90.5%       |
| <b>Total</b>            | <b>6</b>    | <b>100%</b> | <b>15</b> | <b>100%</b> | <b>21</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 14.3 History of Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 14.6 Time during Season of Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 1         | 4.8%        |
| Regular season        | 18        | 85.7%       |
| Post season           | 2         | 9.5%        |
| <b>Total</b>          | <b>21</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 14.7 Event or Apparatus for Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                 | n         | %           |
|---------------------------------|-----------|-------------|
| <b>Gymnast event/apparatus</b>  |           |             |
| Floor exercise                  | 9         | 47.4        |
| Warm-up/stretching/conditioning | 3         | 15.8%       |
| Uneven parallel bars            | 2         | 10.5%       |
| Vault                           | 2         | 10.5%       |
| Balance beam                    | 2         | 10.5%       |
| Other                           | 1         | 5.3%        |
| <b>Total</b>                    | <b>19</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 14.8 Practice-Related Variables for Girls' Gymnastics Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | ---       | 0.0%        |
| Second 1/2 hour         | 8         | 66.7%       |
| 1-2 hours into practice | 3         | 25.0%       |
| >2 hours into practice  | 1         | 8.3%        |
| <b>Total</b>            | <b>12</b> | <b>100%</b> |

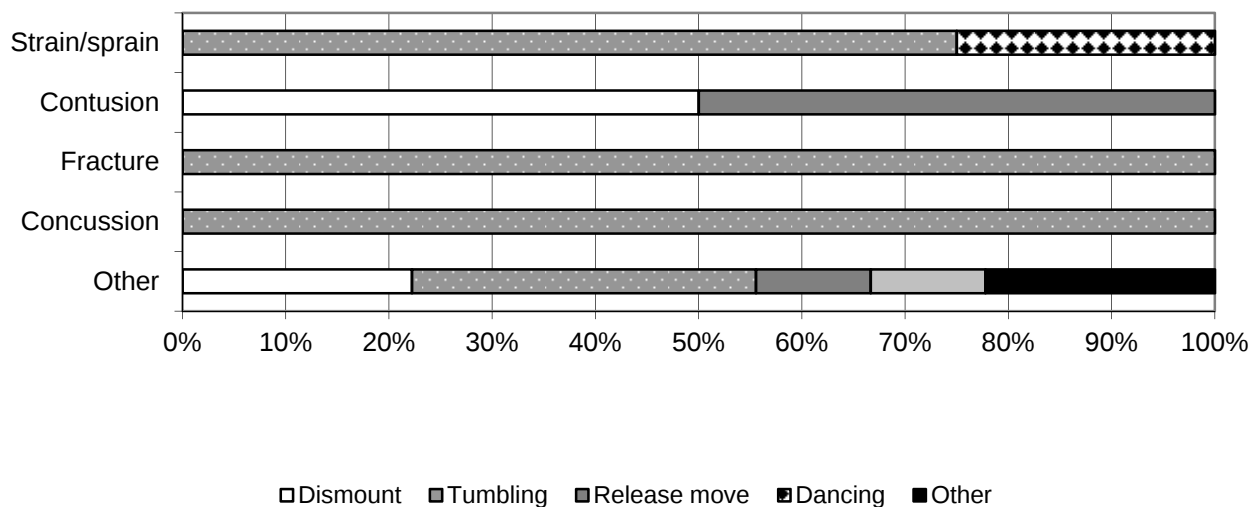
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 14.9 Activities Leading to Girls' Gymnastics Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity     | Competition |             | Practice  |             | Overall   |             |
|--------------|-------------|-------------|-----------|-------------|-----------|-------------|
|              | n           | %           | n         | %           | n         | %           |
| Tumbling     | 3           | 50.0%       | 6         | 42.9%       | 9         | 45.0%       |
| Dismount     | 2           | 33.3%       | 4         | 28.6%       | 6         | 30.0%       |
| Dancing      | ---         | 0.0%        | 1         | 7.1%        | 1         | 5.0%        |
| Mounting     | ---         | 0.0%        | ---       | 0.0%        | ---       | 0.0%        |
| Release move | ---         | 0.0%        | 2         | 14.3%       | 2         | 10.0%       |
| Other        | 1           | 16.7%       | 1         | 7.1%        | 2         | 10.0%       |
| <b>Total</b> | <b>6</b>    | <b>100%</b> | <b>14</b> | <b>100%</b> | <b>20</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 14.4 Activity Resulting in Girls' Gymnastics Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XV. Boys' Ice Hockey Injury Epidemiology**

**Table 15.1 Boys' Ice Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>67</b>  | <b>32,991</b> | <b>2.03</b>                                      |
| Competition  | 48         | 11,474        | 4.18                                             |
| Practice     | 19         | 21,517        | 0.88                                             |

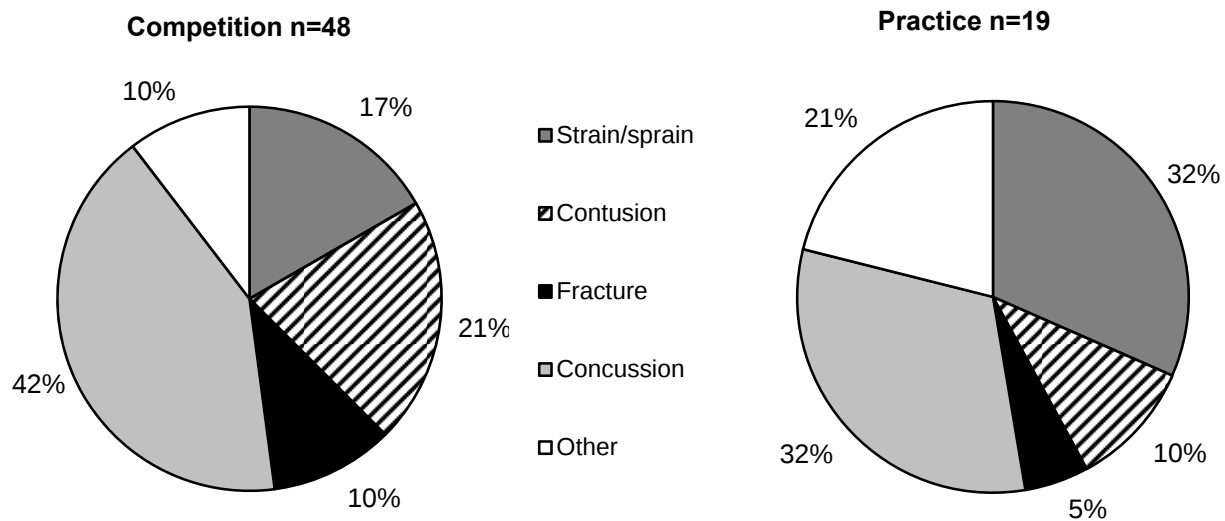
**Table 15.2 Demographic Characteristics of Injured Boys' Ice Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=65</b> |
| Freshman                 | 10.8%       |
| Sophomore                | 26.2%       |
| Junior                   | 32.3%       |
| Senior                   | 30.8%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 14          |
| Maximum                  | 18          |
| Mean (St. Dev.)          | 16.3 (1.2)  |
| <b>BMI</b>               |             |
| Minimum                  | 19.9        |
| Maximum                  | 33.8        |
| Mean (St. Dev.)          | 24.1 (3.0)  |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 15.1 Diagnosis of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 15.3 Body Site of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Competition |             | Practice  |             | Overall   |             |
|---------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                     | n           | %           | n         | %           | n         | %           |
| <b>Body Site</b>    |             |             |           |             |           |             |
| Head/face           | 22          | 45.8%       | 7         | 36.8%       | 29        | 43.3%       |
| Trunk               | 6           | 12.5%       | 3         | 15.8%       | 9         | 13.4%       |
| Shoulder            | 6           | 12.5%       | 1         | 5.3%        | 7         | 10.4%       |
| Knee                | 4           | 8.3%        | 1         | 5.3%        | 5         | 7.5%        |
| Hip/thigh/upper leg | 1           | 2.1%        | 3         | 15.8%       | 4         | 6.0%        |
| Hand/wrist          | ---         | 0.0%        | 3         | 15.8%       | 3         | 4.5%        |
| Arm/elbow           | 3           | 6.3%        | ---       | 0.0%        | 3         | 4.5%        |
| Lower leg           | 1           | 2.1%        | ---       | 0.0%        | 1         | 1.5%        |
| Ankle               | ---         | 0.0%        | ---       | 0.0%        | ---       | 0.0%        |
| Foot                | ---         | 0.0%        | ---       | 0.0%        | ---       | 0.0%        |
| Neck                | ---         | 0.0%        | ---       | 0.0%        | ---       | 0.0%        |
| Other               | 5           | 10.4%       | 1         | 5.3%        | 6         | 9.0%        |
| <b>Total</b>        | <b>48</b>   | <b>100%</b> | <b>19</b> | <b>100%</b> | <b>67</b> | <b>100%</b> |

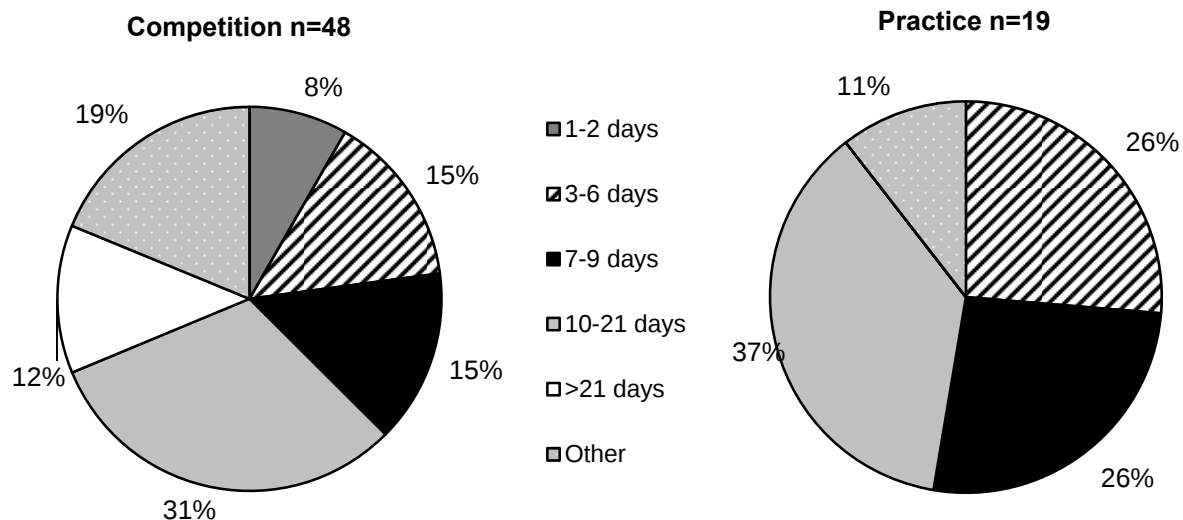
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 15.4 Ten Most Common Boys' Ice Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=48 |       | Practice<br>n=19 |       | Total<br>n=67 |       |
|-----------------------------------|---------------------|-------|------------------|-------|---------------|-------|
|                                   | n                   | %     | n                | %     | n             | %     |
| Head/face concussion              | 20                  | 41.7% | 6                | 31.6% | 26            | 38.8% |
| Trunk strain/sprain               | 2                   | 4.2%  | 3                | 15.8% | 5             | 7.5%  |
| Shoulder strain/sprain            | 4                   | 8.3%  | ---              | 0.0%  | 4             | 6.0%  |
| Trunk contusion                   | 3                   | 6.3%  | ---              | 0.0%  | 3             | 4.5%  |
| Shoulder other                    | 1                   | 2.1%  | 1                | 5.3%  | 2             | 3.0%  |
| Hip/thigh/upper leg contusion     | 1                   | 2.1%  | 1                | 5.3%  | 2             | 3.0%  |
| Hip/thigh/upper leg strain/sprain | ---                 | 0.0%  | 2                | 10.5% | 2             | 3.0%  |
| Knee strain/sprain                | 1                   | 2.1%  | 1                | 5.3%  | 2             | 3.0%  |
| Arm/elbow contusion               | 2                   | 4.2%  | ---              | 0.0%  | 2             | 3.0%  |
| Knee other                        | 2                   | 4.2%  | ---              | 0.0%  | 2             | 3.0%  |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 15.2 Time Loss of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



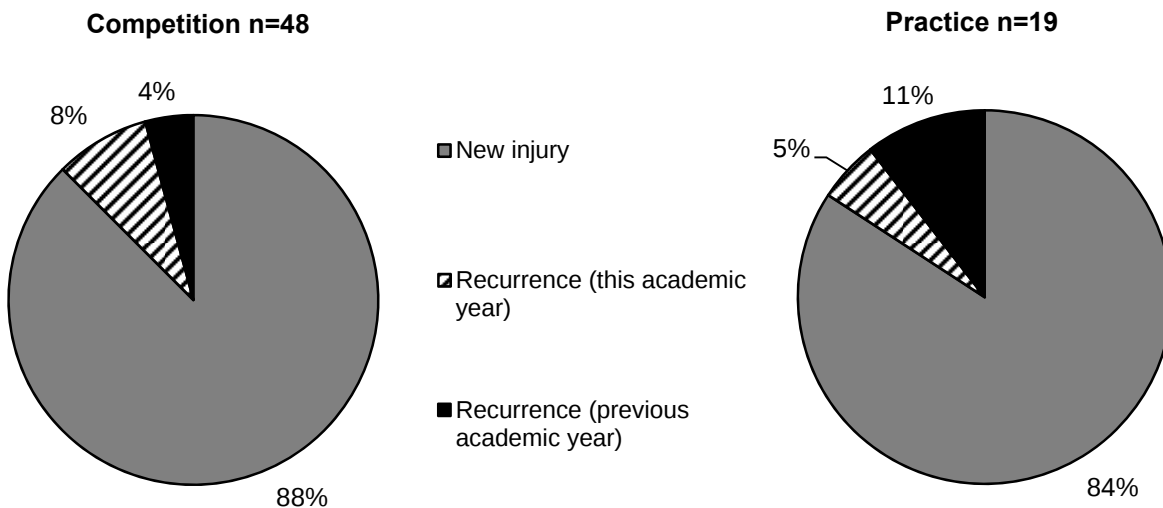
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 15.5 Boys' Ice Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |           |             |
| Required surgery        | 4           | 8.3%        | 2         | 11.1%       | 6         | 9.1%        |
| Did not require surgery | 44          | 91.7%       | 16        | 88.9%       | 60        | 90.9%       |
| <b>Total</b>            | <b>48</b>   | <b>100%</b> | <b>18</b> | <b>100%</b> | <b>66</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 15.3 History of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 15.6 Time during Season of Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 4         | 6.1%        |
| Regular season        | 62        | 93.9%       |
| Post season           | ---       | 0.0%        |
| <b>Total</b>          | <b>67</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 15.7 Competition-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                 | n         | %           |
|---------------------------------|-----------|-------------|
| <b>Time in Competition</b>      |           |             |
| Warm-ups                        | ---       | 0.0%        |
| First period                    | 8         | 17.4%       |
| Second period                   | 22        | 47.8%       |
| Third period                    | 15        | 32.6%       |
| Overtime                        | 1         | 2.2%        |
| <b>Total</b>                    | <b>46</b> | <b>100%</b> |
| <b>Rink Location</b>            |           |             |
| Between goal line and blue line | 16        | 36.4%       |
| Corner                          | 12        | 27.3%       |
| Neutral zone                    | 6         | 13.6%       |
| Behind goal                     | 5         | 11.4%       |
| Goal area                       | 5         | 11.4%       |
| <b>Total</b>                    | <b>44</b> | <b>100%</b> |

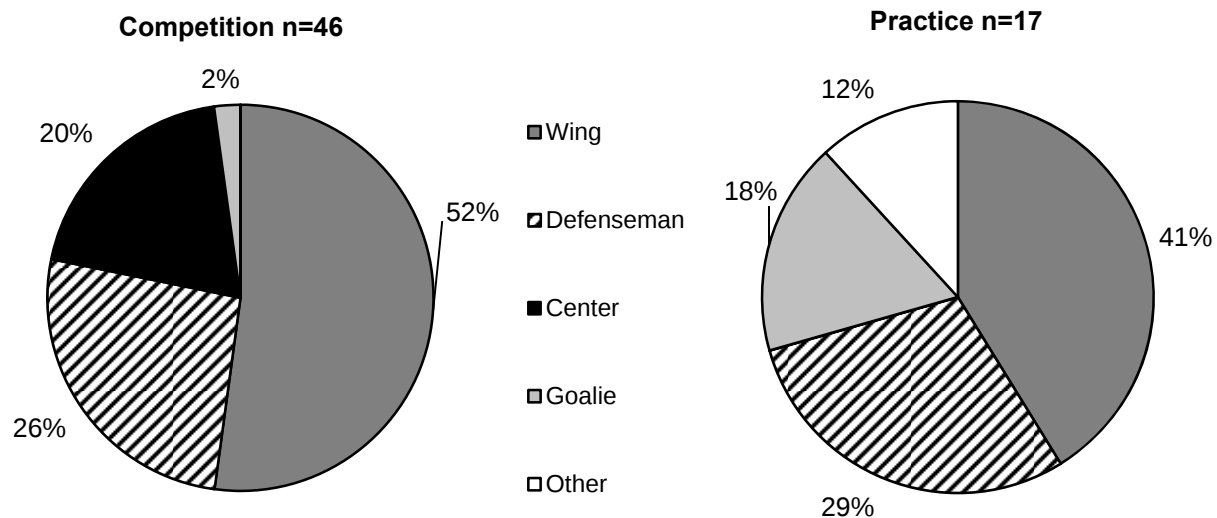
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 15.8 Practice-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | ---       | 0.0%        |
| Second 1/2 hour         | 11        | 61.1%       |
| 1-2 hours into practice | 6         | 33.3%       |
| >2 hours into practice  | 1         | 5.6%        |
| <b>Total</b>            | <b>18</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 15.4 Player Position of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

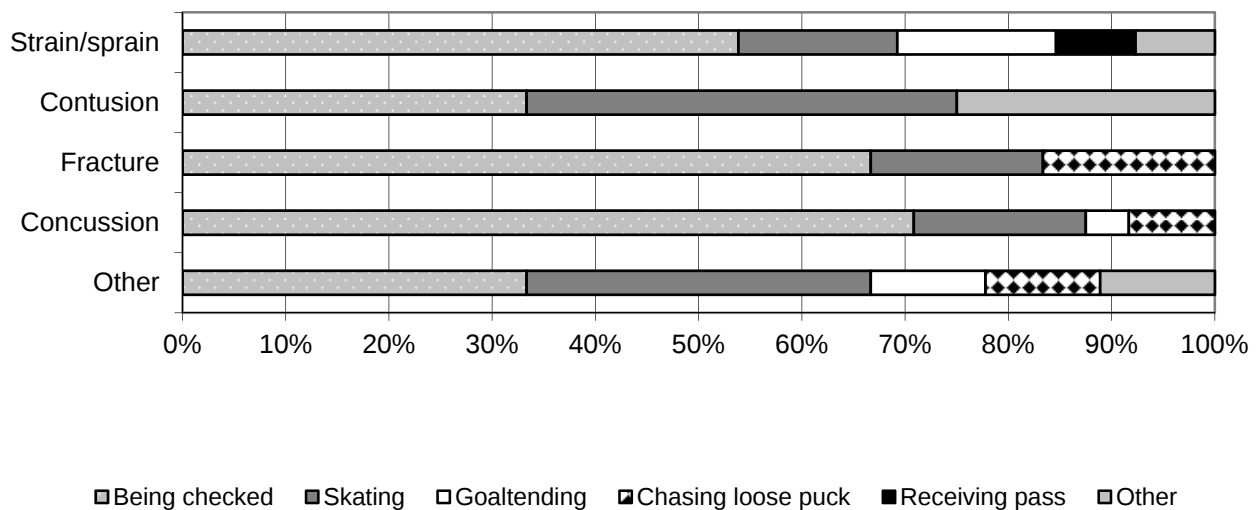


**Table 15.9 Activities Leading to Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity           | Competition |             | Practice  |             | Overall   |             |
|--------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                    | n           | %           | n         | %           | n         | %           |
| Being checked      | 30          | 63.8%       | 5         | 29.4%       | 35        | 54.7%       |
| Skating            | 8           | 17.0%       | 7         | 41.2%       | 15        | 23.4%       |
| Chasing loose puck | 3           | 6.4%        | 1         | 5.9%        | 4         | 6.3%        |
| Goaltending        | 1           | 2.1%        | 3         | 17.6%       | 4         | 6.3%        |
| Passing            | 2           | 4.3%        | ---       | 0.0%        | 2         | 3.1%        |
| Shooting           | 2           | 4.3%        | ---       | 0.0%        | 2         | 3.1%        |
| Receiving pass     | ---         | 0.0%        | 1         | 5.9%        | 1         | 1.6%        |
| Other              | 1           | 2.1%        | ---       | 0.0%        | 1         | 1.6%        |
| <b>Total</b>       | <b>47</b>   | <b>100%</b> | <b>17</b> | <b>100%</b> | <b>64</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 15.5 Activity Resulting in Boys' Ice Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XVI. Boys' Lacrosse Injury Epidemiology**

**Table 16.1 Boys' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>178</b> | <b>76,925</b> | <b>2.31</b>                                      |
| Competition  | 105        | 24,276        | 4.33                                             |
| Practice     | 73         | 52,649        | 1.39                                             |

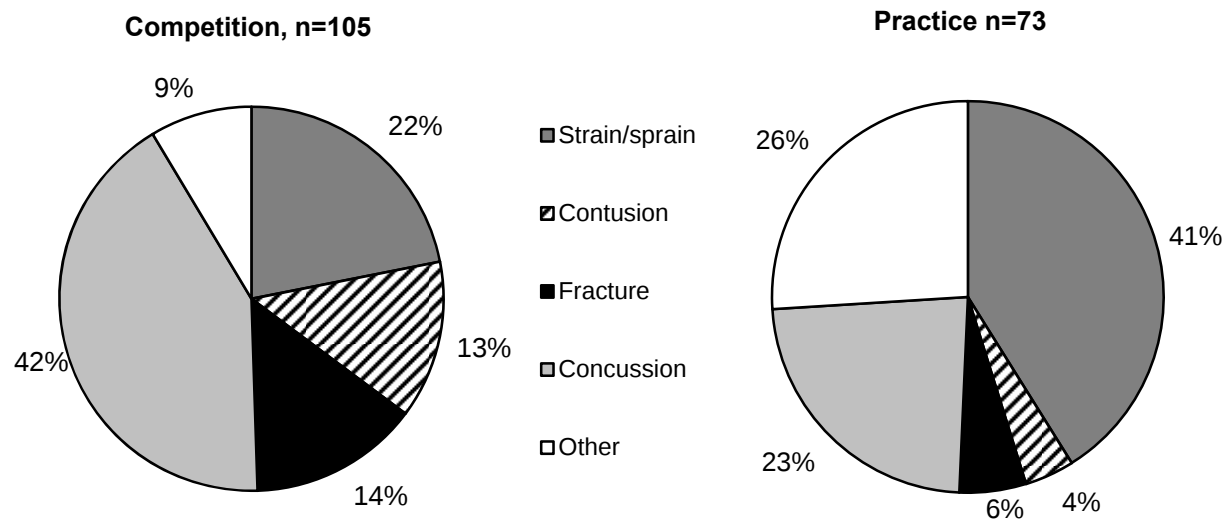
**Table 16.2 Demographic Characteristics of Injured Boys' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=177</b> |
| Freshman                 | 23.2%        |
| Sophomore                | 27.7%        |
| Junior                   | 23.7%        |
| Senior                   | 25.4%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 21           |
| Mean (St. Dev.)          | 16.2 (1.4)   |
| <b>BMI</b>               |              |
| Minimum                  | 16.6         |
| Maximum                  | 36.9         |
| Mean (St. Dev.)          | 24.1 (2.8)   |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 16.1 Diagnosis of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 16.3 Body Site of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

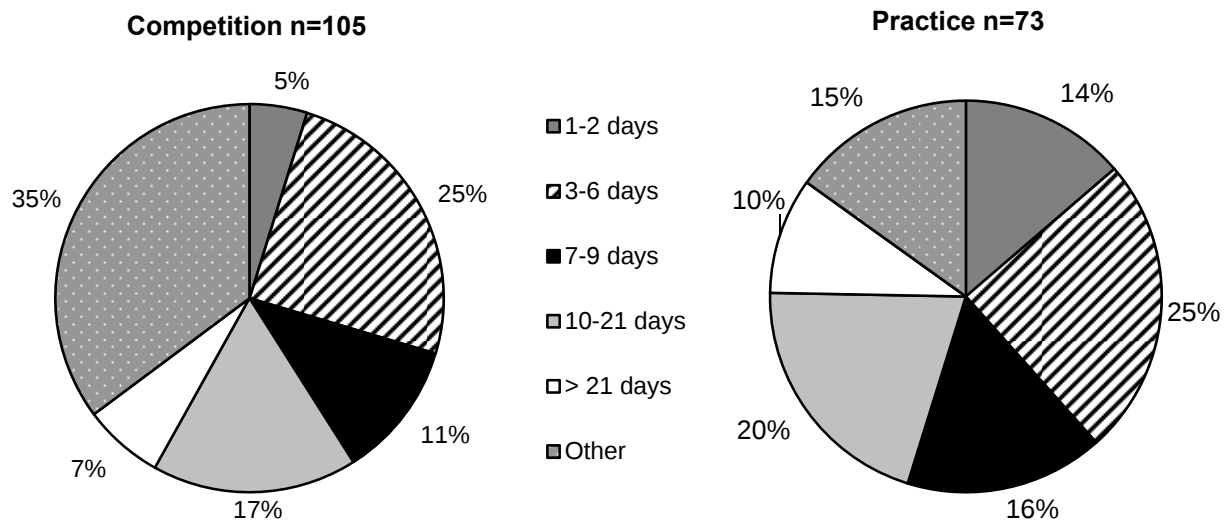
|                     | Competition |             | Practice  |             | Overall    |             |
|---------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                     | n           | %           | n         | %           | n          | %           |
| <b>Body Site</b>    |             |             |           |             |            |             |
| Head/face           | 44          | 41.9%       | 20        | 27.4%       | 64         | 36.0%       |
| Hip/thigh/upper leg | 10          | 9.5%        | 11        | 15.1%       | 21         | 11.8%       |
| Ankle               | 10          | 9.5%        | 7         | 9.6%        | 17         | 9.6%        |
| Knee                | 8           | 7.6%        | 7         | 9.6%        | 15         | 8.4%        |
| Hand/wrist          | 10          | 9.5%        | 5         | 6.8%        | 15         | 8.4%        |
| Trunk               | 9           | 8.6%        | 4         | 5.5%        | 13         | 7.3%        |
| Lower leg           | 2           | 1.9%        | 11        | 15.1%       | 13         | 7.3%        |
| Shoulder            | 2           | 1.9%        | 3         | 4.1%        | 5          | 2.8%        |
| Arm/elbow           | 4           | 3.8%        | ---       | 0.0%        | 4          | 2.2%        |
| Foot                | 1           | 1.0%        | 3         | 4.1%        | 4          | 2.2%        |
| Neck                | 1           | 1.0%        | ---       | 0.0%        | 1          | 0.6%        |
| Other               | 4           | 3.8%        | 2         | 2.7%        | 6          | 3.4%        |
| <b>Total</b>        | <b>105</b>  | <b>100%</b> | <b>73</b> | <b>100%</b> | <b>178</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 16.4 Ten Most Common Boys' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=105 |       | Practice<br>n=73 |       | Total<br>n=178 |       |
|-----------------------------------|----------------------|-------|------------------|-------|----------------|-------|
|                                   | n                    | %     | n                | %     | n              | %     |
| Head/face concussion              | 44                   | 41.9% | 17               | 23.3% | 61             | 34.3% |
| Ankle strain/sprain               | 8                    | 7.6%  | 7                | 9.6%  | 15             | 8.4%  |
| Hip/thigh/upper leg strain/sprain | 4                    | 3.8%  | 10               | 13.7% | 14             | 7.9%  |
| Hand/wrist fracture               | 6                    | 5.7%  | 3                | 4.1%  | 9              | 5.1%  |
| Lower leg other                   | 1                    | 1.0%  | 7                | 9.6%  | 8              | 4.5%  |
| Trunk strain/sprain               | 3                    | 2.9%  | 3                | 4.1%  | 6              | 3.4%  |
| Knee strain/sprain                | 2                    | 1.9%  | 3                | 4.1%  | 5              | 2.8%  |
| Trunk contusion                   | 5                    | 4.8%  | ---              | 0.0%  | 5              | 2.8%  |
| Hand/wrist sprain/strain          | 2                    | 1.9%  | 2                | 2.7%  | 4              | 2.2%  |
| Shoulder other                    | 1                    | 1.0%  | 2                | 2.7%  | 3              | 1.7%  |

**Figure 16.2 Time Loss of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



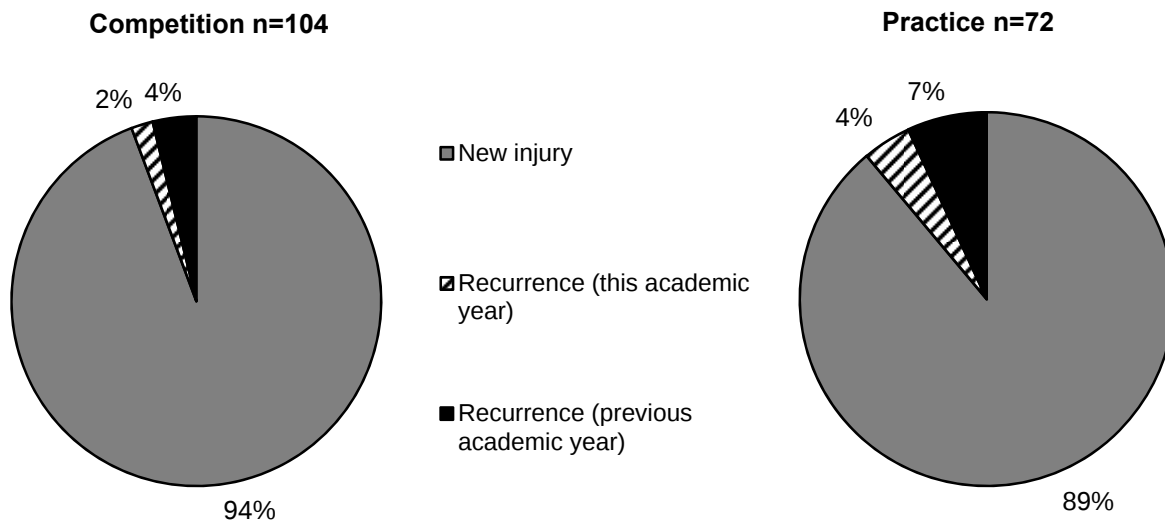
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 16.5 Boys' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall    |             |
|-------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                         | n           | %           | n         | %           | n          | %           |
| <b>Need for surgery</b> |             |             |           |             |            |             |
| Required surgery        | 5           | 4.9%        | 6         | 8.3%        | 11         | 6.3%        |
| Did not require surgery | 98          | 95.1%       | 66        | 91.7%       | 164        | 93.7%       |
| <b>Total</b>            | <b>103</b>  | <b>100%</b> | <b>72</b> | <b>100%</b> | <b>175</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 16.3 History of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 16.6 Time during Season of Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 35         | 19.7%       |
| Regular season        | 135        | 75.8%       |
| Post season           | 8          | 4.5%        |
| <b>Total</b>          | <b>178</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 16.7 Competition-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | <b>n</b>  | <b>%</b>    |
|----------------------------|-----------|-------------|
| <b>Time in Competition</b> |           |             |
| Pre-competition/warm-ups   | 2         | 2.0%        |
| First quarter              | 11        | 11.1%       |
| Second quarter             | 35        | 35.4%       |
| Third quarter              | 33        | 33.3%       |
| Fourth quarter             | 18        | 18.2%       |
| Overtime                   | ---       | 9.0%        |
| <b>Total</b>               | <b>99</b> | <b>100%</b> |
| <b>Field Location</b>      |           |             |
| Midfield                   | 35        | 36.1%       |
| Defensive area             | 28        | 28.9%       |
| Goal area                  | 27        | 27.8%       |
| Wing area                  | 6         | 6.2%        |
| Sideline                   | 1         | 1.0%        |
| <b>Total</b>               | <b>97</b> | <b>100%</b> |

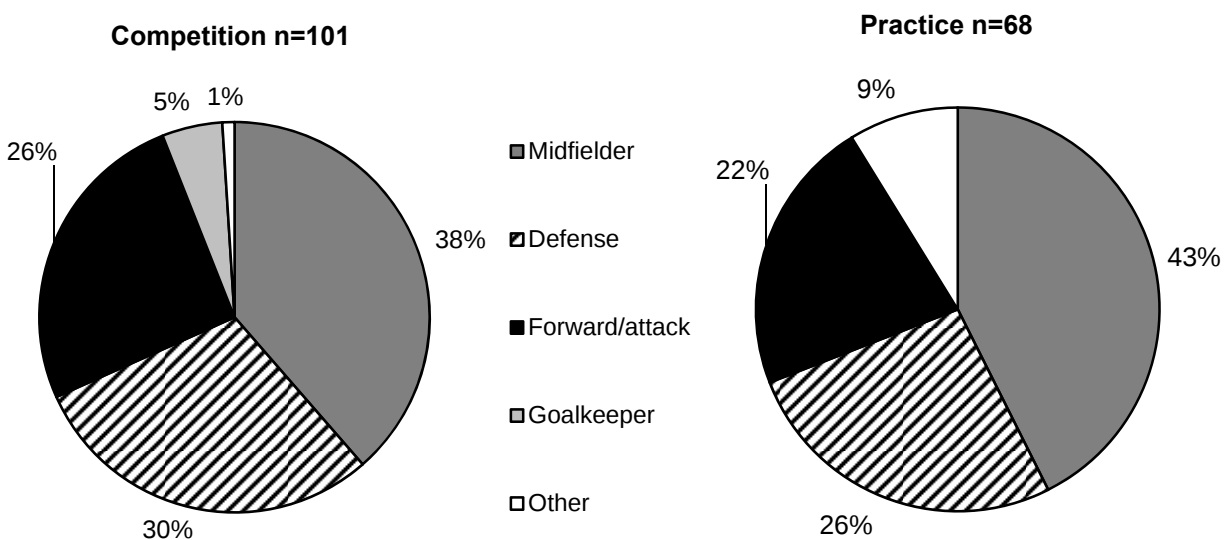
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 16.8 Practice-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First ½ hour            | 7         | 10.8%       |
| Second ½ hour           | 13        | 20.0%       |
| 1-2 hours into practice | 33        | 50.8%       |
| > 2 hours into practice | 12        | 18.5%       |
| <b>Total</b>            | <b>65</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 16.4 Player Position of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

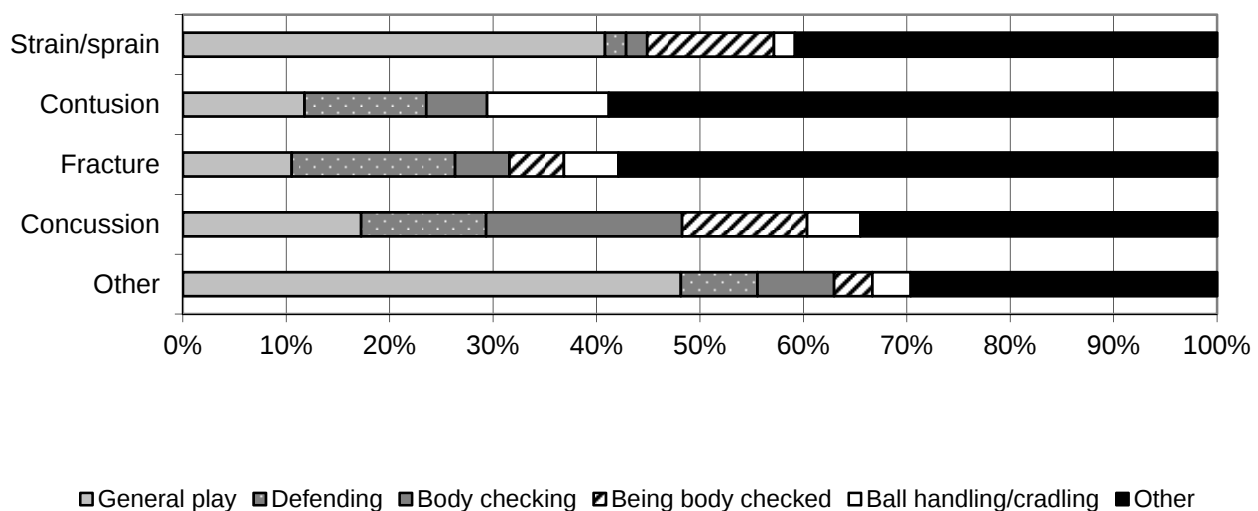


**Table 16.9 Activities Leading to Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                   | Competition |             | Practice  |             | Overall    |             |
|----------------------------|-------------|-------------|-----------|-------------|------------|-------------|
|                            | n           | %           | n         | %           | n          | %           |
| General play               | 17          | 16.8%       | 30        | 43.5%       | 47         | 27.6%       |
| Chasing loose ball         | 10          | 9.9%        | 6         | 8.7%        | 16         | 9.4%        |
| Body checking              | 12          | 11.9%       | 4         | 5.8%        | 16         | 9.4%        |
| Being body checked         | 8           | 7.9%        | 7         | 10.1%       | 15         | 8.8%        |
| Defending                  | 12          | 11.9%       | 3         | 4.3%        | 15         | 8.8%        |
| Being crosse/stick checked | 11          | 10.9%       | ---       | 0.0%        | 11         | 6.5%        |
| Conditioning               | ---         | 0.0%        | 9         | 13.0%       | 9          | 5.3%        |
| Ball handling/cradling     | 7           | 6.9%        | 1         | 1.4%        | 8          | 4.7%        |
| Shooting                   | 5           | 5.0%        | 1         | 1.4%        | 6          | 3.5%        |
| Receiving pass             | 3           | 3.0%        | 2         | 2.9%        | 5          | 2.9%        |
| Passing                    | 3           | 3.0%        | 1         | 1.4%        | 4          | 2.4%        |
| Face-off                   | 3           | 3.0%        | 1         | 1.4%        | 4          | 2.4%        |
| Goaltending                | 3           | 3.0%        | ---       | 0.0%        | 3          | 1.8%        |
| Crosse/stick checking      | 3           | 3.0%        | ---       | 0.0%        | 3          | 1.8%        |
| Blocking shot              | ---         | 0.0%        | 3         | 4.3%        | 3          | 1.8%        |
| <b>Total</b>               | <b>101</b>  | <b>100%</b> | <b>69</b> | <b>100%</b> | <b>170</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 16.5 Activity Resulting in Boys' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XVII. Girls' Lacrosse Injury Epidemiology**

**Table 17.1 Girls' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>68</b>  | <b>55,175</b> | <b>1.23</b>                                      |
| Competition  | 27         | 17,453        | 1.55                                             |
| Practice     | 41         | 37,722        | 1.09                                             |

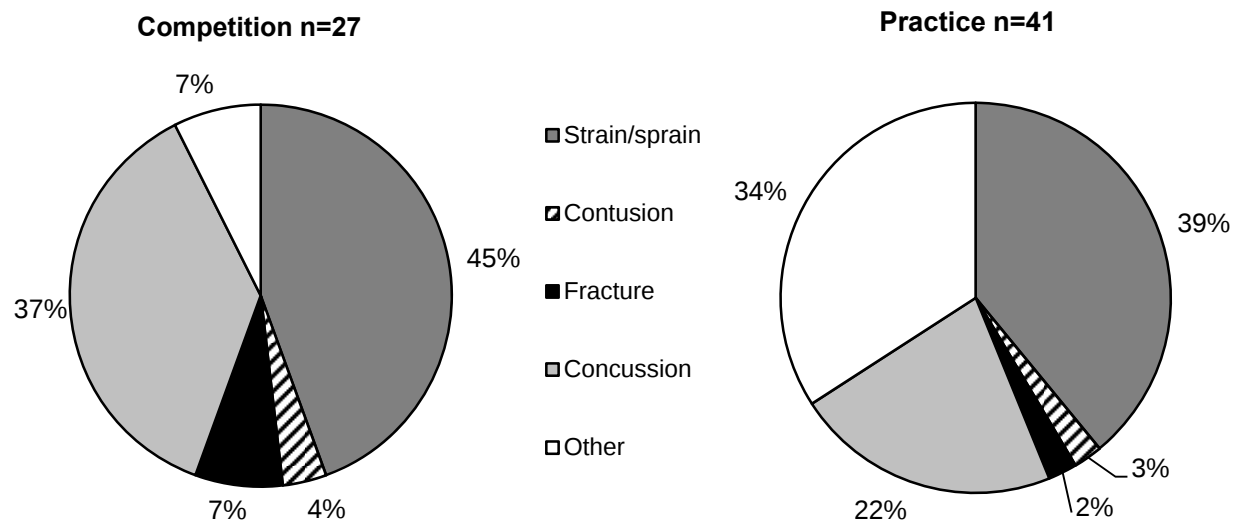
**Table 17.2 Demographic Characteristics of Injured Girls' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                       |             |
|-----------------------|-------------|
| <b>Year in School</b> | <b>n=68</b> |
| Freshman              | 19.1%       |
| Sophomore             | 29.4%       |
| Junior                | 25.0%       |
| Senior                | 26.5%       |
| <b>Total</b>          | <b>100%</b> |
| <b>Age (years)</b>    |             |
| Minimum               | 13          |
| Maximum               | 18          |
| Mean (St. Dev.)       | 15.9 (1.3)  |
| <b>BMI</b>            |             |
| Minimum               | 16.6        |
| Maximum               | 33.5        |
| Mean (St. Dev.)       | 21.5 (2.9)  |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 17.1 Diagnosis of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 17.3 Body Site of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

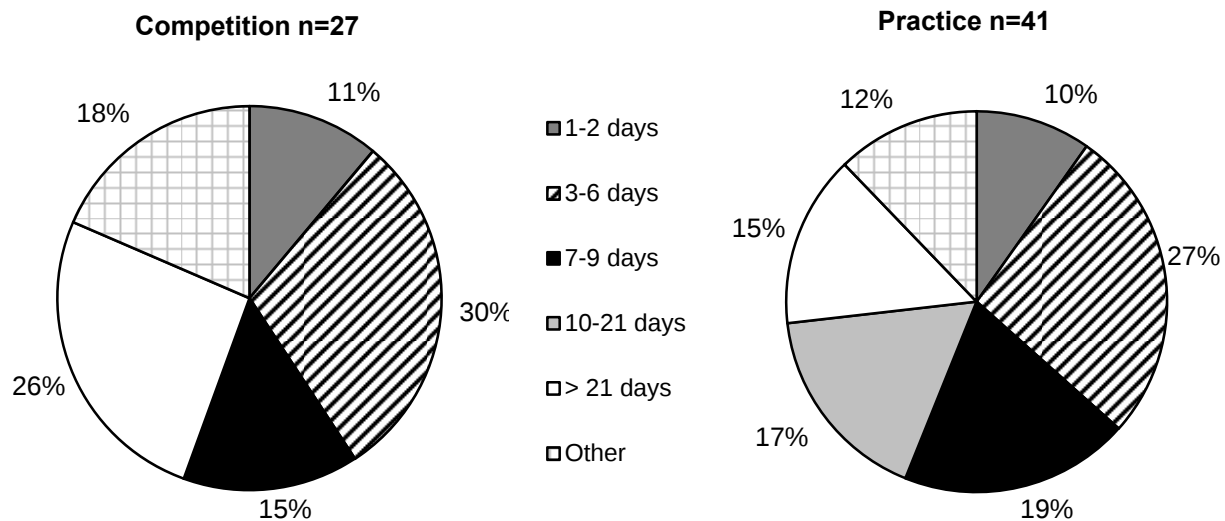
|                     | Competition |             | Practice  |             | Overall   |             |
|---------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                     | n           | %           | n         | %           | n         | %           |
| <b>Body Site</b>    |             |             |           |             |           |             |
| Head/face           | 11          | 40.7%       | 10        | 24.4%       | 21        | 30.9%       |
| Ankle               | 6           | 22.2%       | 9         | 22.0%       | 15        | 22.1%       |
| Knee                | 4           | 14.8%       | 4         | 9.8%        | 8         | 11.8%       |
| Hip/thigh/upper leg | 1           | 3.7%        | 7         | 17.1%       | 8         | 11.8%       |
| Trunk               | 1           | 3.7%        | 3         | 7.3%        | 4         | 5.9%        |
| Lower leg           | ---         | 0.0%        | 3         | 7.3%        | 3         | 4.4%        |
| Hand/wrist          | 2           | 7.4%        | ---       | 0.0%        | 2         | 2.9%        |
| Foot                | ---         | 0.0%        | 2         | 4.9%        | 2         | 2.9%        |
| Neck                | 2           | 7.4%        | ---       | 0.0%        | 2         | 2.9%        |
| Arm/elbow           | ---         | 0.0%        | 1         | 2.4%        | 1         | 1.5%        |
| Shoulder            | ---         | 0.0%        | 1         | 2.4%        | 1         | 1.5%        |
| Other               | ---         | 0.0%        | 1         | 2.4%        | 1         | 1.5%        |
| <b>Total</b>        | <b>27</b>   | <b>100%</b> | <b>41</b> | <b>100%</b> | <b>68</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 17.4 Ten Most Common Girls' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis                         | Competition<br>n=27 |       | Practice<br>n=41 |       | Total<br>n=68 |       |
|-----------------------------------|---------------------|-------|------------------|-------|---------------|-------|
|                                   | n                   | %     | n                | %     | n             | %     |
| Head/face concussion              | 10                  | 37.0% | 9                | 22.0% | 19            | 27.9% |
| Ankle strain/sprain               | 6                   | 22.2% | 9                | 22.0% | 15            | 22.1% |
| Hip/thigh/upper leg strain/sprain | 1                   | 3.7%  | 6                | 14.6% | 7             | 10.3% |
| Knee other                        | 1                   | 3.7%  | 3                | 7.3%  | 4             | 5.9%  |
| Lower leg other                   | ---                 | 0.0%  | 3                | 7.3%  | 3             | 4.4%  |
| Knee strain/sprain                | 2                   | 7.4%  | ---              | 0.0%  | 2             | 2.9%  |
| Hand/wrist fracture               | 2                   | 7.4%  | ---              | 0.0%  | 2             | 2.9%  |
| Neck strain/sprain                | 2                   | 7.4%  | ---              | 0.0%  | 2             | 2.9%  |
| Trunk strain/sprain               | 1                   | 3.7%  | ---              | 0.0%  | 1             | 1.5%  |
| Foot strain/sprain                | ---                 | 0.0%  | 1                | 2.4%  | 1             | 1.5%  |

**Figure 17.2 Time Loss of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



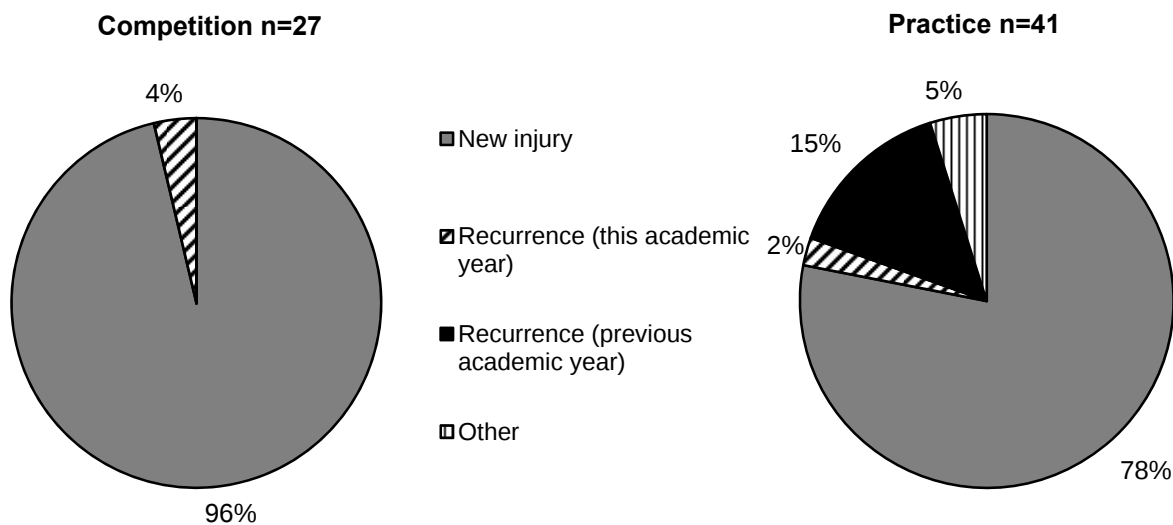
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 17.5 Girls' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |           |             |
| Required surgery        | 3           | 11.1%       | ---       | 0.0%        | 3         | 4.5%        |
| Did not require surgery | 24          | 88.9%       | 40        | 100%        | 64        | 95.5%       |
| <b>Total</b>            | <b>27</b>   | <b>100%</b> | <b>40</b> | <b>100%</b> | <b>67</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 17.3 History of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 17.6 Time during Season of Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 12        | 17.9%       |
| Regular season        | 52        | 77.6%       |
| Post season           | 3         | 4.5%        |
| <b>Total</b>          | <b>67</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 17.7 Competition-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                   | n         | %           |
|---------------------------------------------------|-----------|-------------|
| <b>Time in Competition</b>                        |           |             |
| Pre-Competition-Warm-ups                          | ---       | 0.0%        |
| First half                                        | 11        | 42.3%       |
| Second half                                       | 15        | 57.7%       |
| Overtime                                          | ---       | 0.0%        |
| <b>Total</b>                                      | <b>26</b> | <b>100%</b> |
| <b>Field Location</b>                             |           |             |
| Midfield (between restraining lines)              | 13        | 56.5%       |
| Critical scoring area (including the fan and arc) | 3         | 13.0%       |
| Center circle                                     | 3         | 13.0%       |
| Goal circle                                       | 2         | 8.7%        |
| Sideline                                          | 1         | 4.3%        |
| Endline                                           | 1         | 4.3%        |
| <b>Total</b>                                      | <b>23</b> | <b>100%</b> |

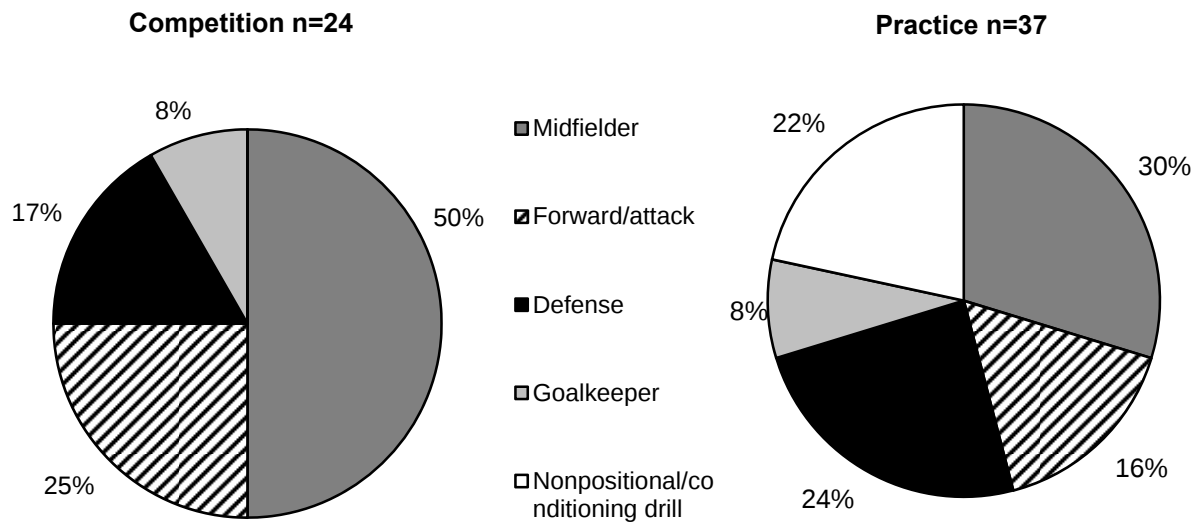
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 17.8 Practice-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 6         | 15.8%       |
| Second 1/2 hour         | 11        | 28.9%       |
| 1-2 hours into practice | 15        | 39.5%       |
| >2 hours into practice  | 6         | 15.8%       |
| <b>Total</b>            | <b>38</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 17.4 Player Position of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

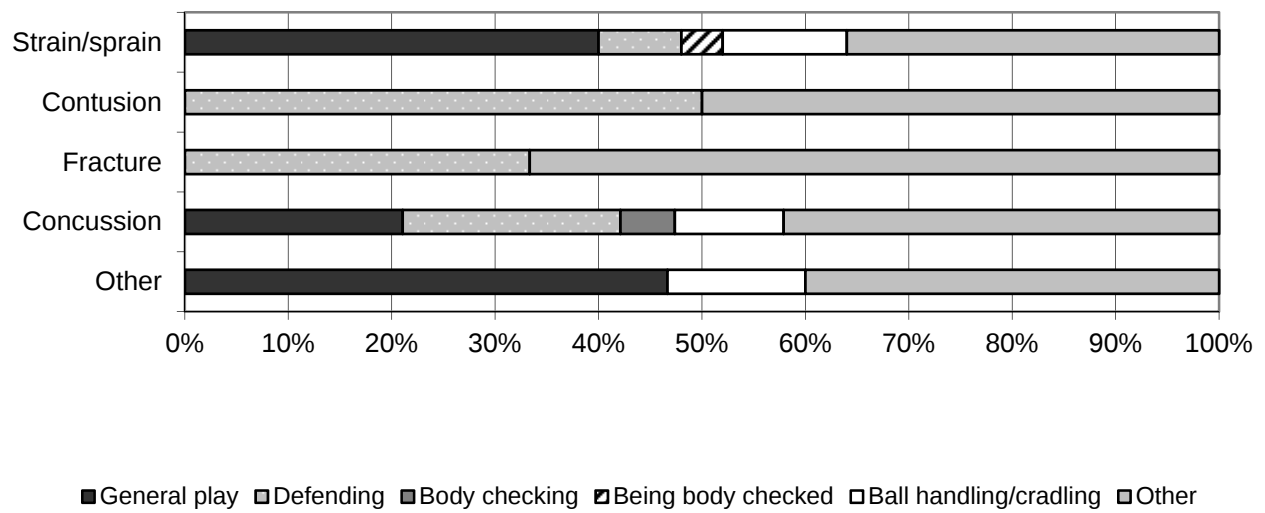


**Table 17.9 Activities Leading to Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                   | Competition |             | Practice  |             | Overall   |             |
|----------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                            | n           | %           | n         | %           | n         | %           |
| General play               | 7           | 28.0%       | 14        | 35.9%       | 21        | 32.8%       |
| Conditioning               | ---         | 0.0%        | 8         | 20.5%       | 8         | 12.5%       |
| Defending                  | 4           | 16.0%       | 4         | 10.3%       | 8         | 12.5%       |
| Ball handling/cradling     | 5           | 20.0%       | 2         | 5.1%        | 7         | 10.9%       |
| Goaltending                | 2           | 8.0%        | 3         | 7.7%        | 5         | 7.8%        |
| Chasing loose ball         | 2           | 8.0%        | 2         | 5.1%        | 4         | 6.3%        |
| Receiving pass             | 1           | 4.0%        | 2         | 5.1%        | 3         | 4.7%        |
| Passing                    | ---         | 0.0%        | 2         | 5.1%        | 2         | 3.1%        |
| Shooting                   | ---         | 0.0%        | 1         | 2.6%        | 1         | 1.6%        |
| Being crosse/stick checked | 1           | 4.0%        | ---       | 0.0%        | 1         | 1.6%        |
| Being body checked         | 1           | 4.0%        | ---       | 0.0%        | 1         | 1.6%        |
| Body checking              | 1           | 3.7%        | ---       | 0.0%        | 1         | 1.6%        |
| Face-off                   | 1           | 3.7%        | ---       | 0.0%        | 1         | 1.6%        |
| Other                      | ---         | 0.0%        | 1         | 2.6%        | 1         | 1.6%        |
| <b>Total</b>               | <b>25</b>   | <b>100%</b> | <b>39</b> | <b>100%</b> | <b>64</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 17.5 Activity Resulting in Girls' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XVIII. Boys' Swimming and Diving Injury Epidemiology**

**Table 18.1 Boys' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>12</b>  | <b>63,883</b> | <b>0.19</b>                                      |
| Competition  | 1          | 12,231        | 0.08                                             |
| Practice     | 11         | 51,652        | 0.21                                             |

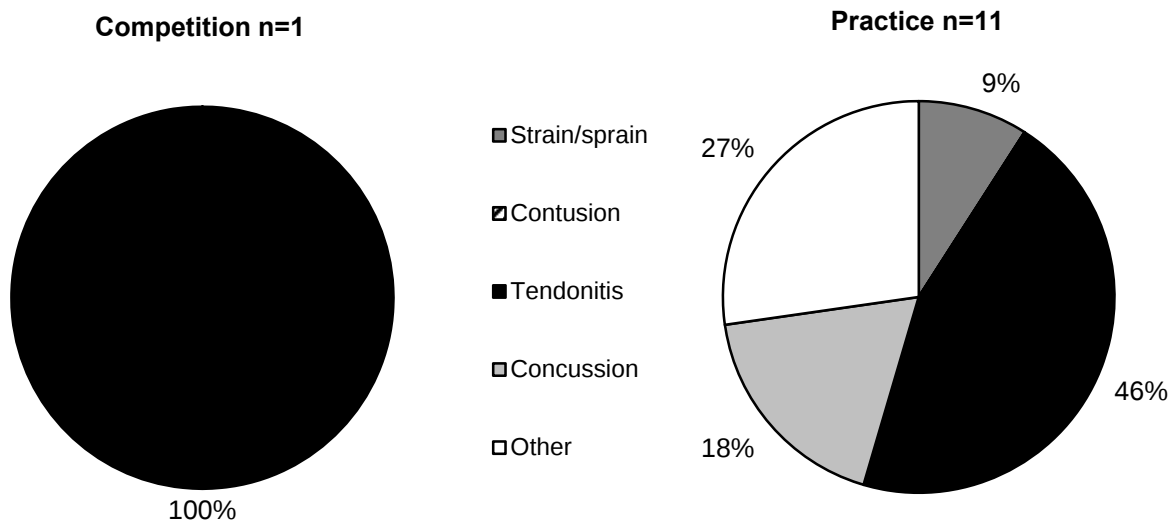
**Table 18.2 Demographic Characteristics of Injured Boys' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=12</b> |
| Freshman                 | 25.0%       |
| Sophomore                | 33.3%       |
| Junior                   | 25.0%       |
| Senior                   | 16.7%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 14          |
| Maximum                  | 17          |
| Mean (St. Dev.)          | 15.8 (1.1)  |
| <b>BMI</b>               |             |
| Minimum                  | 17.9        |
| Maximum                  | 41.2        |
| Mean (St. Dev.)          | 23.0 (6.3)  |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 18.1 Diagnosis of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 18.3 Body Site of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

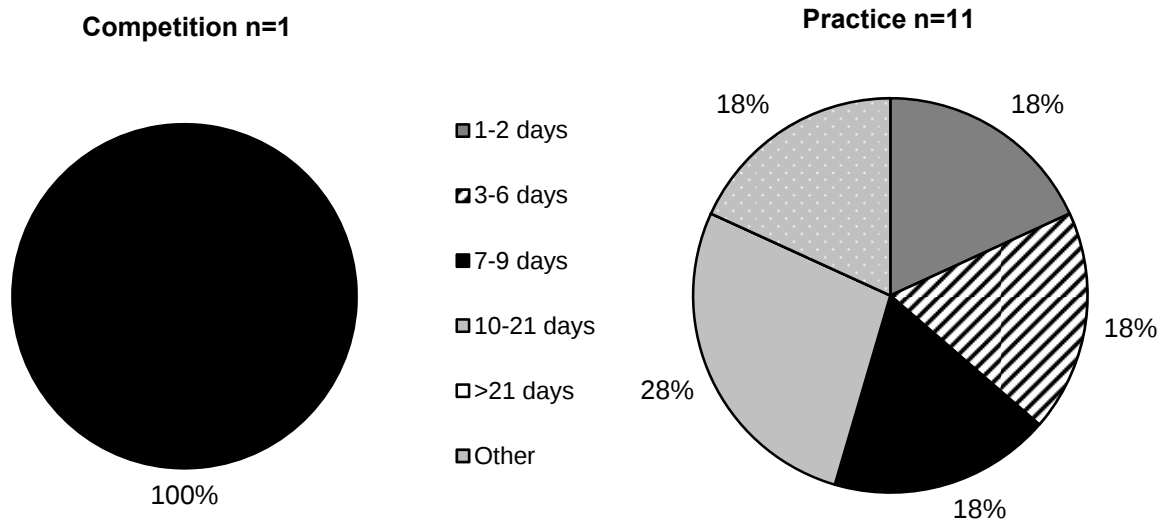
|                  | Competition |             | Practice  |             | Overall   |             |
|------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                  | n           | %           | n         | %           | n         | %           |
| <b>Body Site</b> |             |             |           |             |           |             |
| Shoulder         | 1           | 100.0%      | 7         | 63.6%       | 8         | 66.7%       |
| Head/face        | ---         | 0.0%        | 2         | 18.2%       | 2         | 16.7%       |
| Lower leg        | ---         | 0.0%        | 2         | 18.2%       | 2         | 16.7%       |
| <b>Total</b>     | <b>1</b>    | <b>100%</b> | <b>11</b> | <b>100%</b> | <b>12</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 18.4 Most Common Boys' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis               | Competition<br>n=1 |        | Practice<br>n=11 |       | Total<br>n=12 |       |
|-------------------------|--------------------|--------|------------------|-------|---------------|-------|
|                         | n                  | %      | n                | %     | n             | %     |
| Shoulder other          | 1                  | 100.0% | 7                | 63.6% | 8             | 66.7% |
| Head/face concussion    | ---                | 0.0%   | 2                | 18.2% | 2             | 16.7% |
| Lower leg strain/sprain | ---                | 0.0%   | 1                | 9.1%  | 1             | 8.3%  |
| Lower leg other         | ---                | 0.0%   | 1                | 9.1%  | 1             | 8.3%  |

**Figure 18.2 Time Loss of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



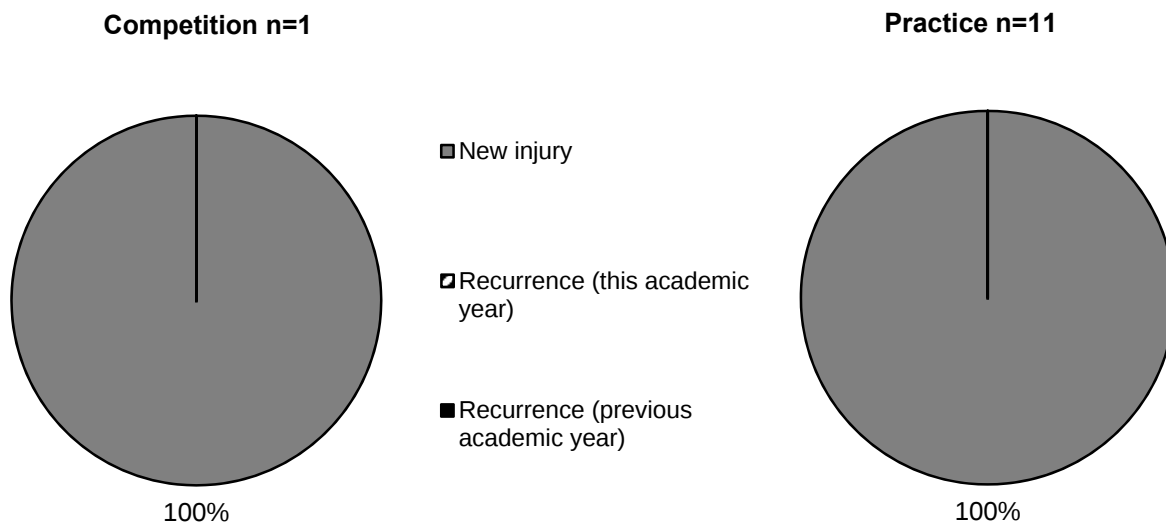
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 18.5 Boys' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |           |             |
| Required surgery        | ---         | 0.0%        | 1         | 9.1%        | 1         | 8.3%        |
| Did not require surgery | 1           | 100.0%      | 10        | 90.9%       | 11        | 91.7%       |
| <b>Total</b>            | <b>1</b>    | <b>100%</b> | <b>11</b> | <b>100%</b> | <b>12</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 18.3 History of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 18.6 Time during Season of Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 3         | 25.0%       |
| Regular season        | 9         | 75.0%       |
| Post season           | ---       | 0.0%        |
| <b>Total</b>          | <b>12</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 18.7 Pool Location for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                      | <b>n</b>  | <b>%</b>    |
|----------------------|-----------|-------------|
| <b>Pool Location</b> |           |             |
| In pool              | 12        | 100.0%      |
| Starting platform    | -         | 0.0%        |
| Poolside             | -         | 0.0%        |
| Other                | -         | 0.0%        |
| <b>Total</b>         | <b>12</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 18.8 Practice-Related Variables for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | <b>n</b>  | <b>%</b>    |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 1         | 9.1%        |
| Second 1/2 hour         | 4         | 36.4%       |
| 1-2 hours into practice | 5         | 45.5%       |
| >2 hours into practice  | 1         | 9.1%        |
| <b>Total</b>            | <b>11</b> | <b>100%</b> |

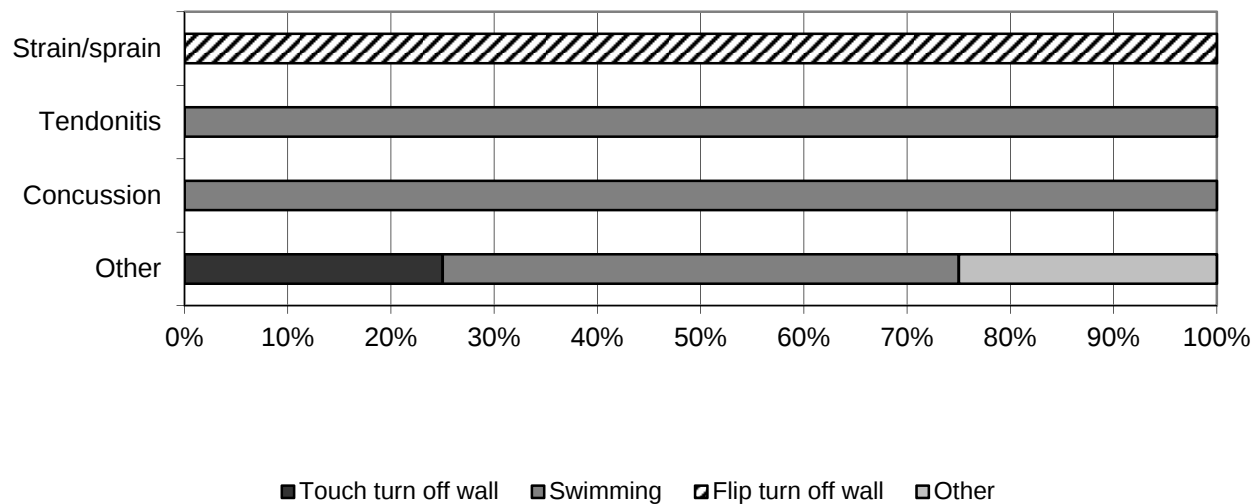
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 18.9 Activities Leading to Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity            | Competition |             | Practice  |             | Overall   |             |
|---------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                     | n           | %           | n         | %           | n         | %           |
| Swimming            | ---         | 0.0%        | 9         | 81.8%       | 9         | 75.0%       |
| Touch turn off wall | ---         | 0.0%        | 1         | 9.1%        | 1         | 8.3%        |
| Flip turn off wall  | ---         | 0.0%        | 1         | 9.1%        | 1         | 8.3%        |
| Other               | 1           | 100.0%      | ---       | 0.0%        | 1         | 8.3%        |
| <b>Total</b>        | <b>1</b>    | <b>100%</b> | <b>11</b> | <b>100%</b> | <b>12</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 18.4 Activity Resulting in Boys' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XIX. Girls' Swimming and Diving Injury Epidemiology**

**Table 19.1 Girls' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures   | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|---------------|--------------------------------------------------|
| <b>Total</b> | <b>28</b>  | <b>73,788</b> | <b>0.38</b>                                      |
| Competition  | 2          | 13,841        | 0.14                                             |
| Practice     | 26         | 59,947        | 0.43                                             |

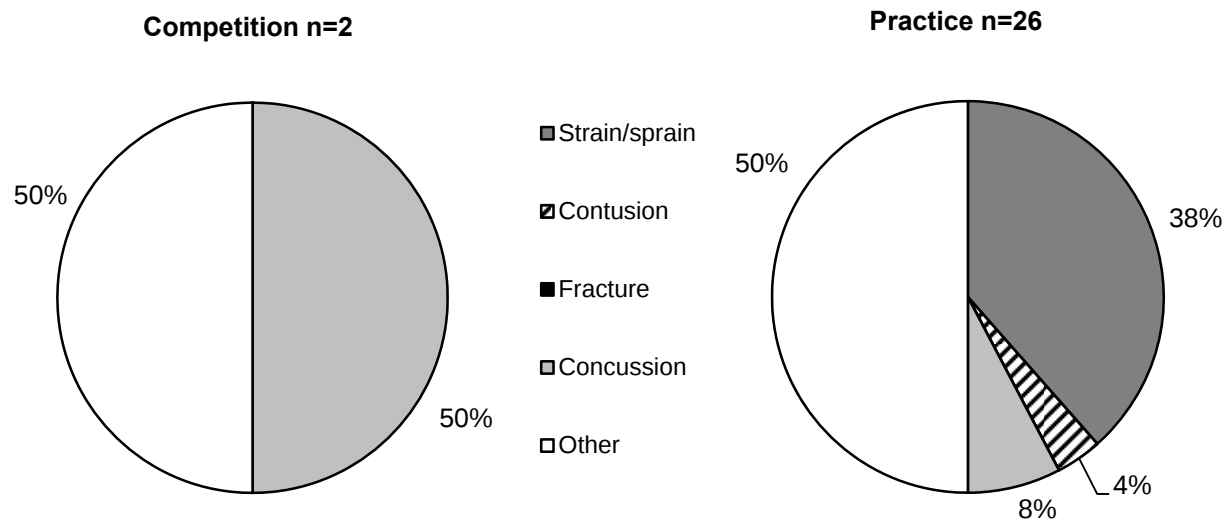
**Table 19.2 Demographic Characteristics of Injured Girls' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=27</b> |
| Freshman                 | 14.8%       |
| Sophomore                | 37.0%       |
| Junior                   | 25.9%       |
| Senior                   | 22.2%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 14          |
| Maximum                  | 18          |
| Mean (St. Dev.)          | 15.7 (1.1)  |
| <b>BMI</b>               |             |
| Minimum                  | 18.0        |
| Maximum                  | 35.1        |
| Mean (St. Dev.)          | 23.5 (3.9)  |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 19.1 Diagnosis of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 19.3 Body Site of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

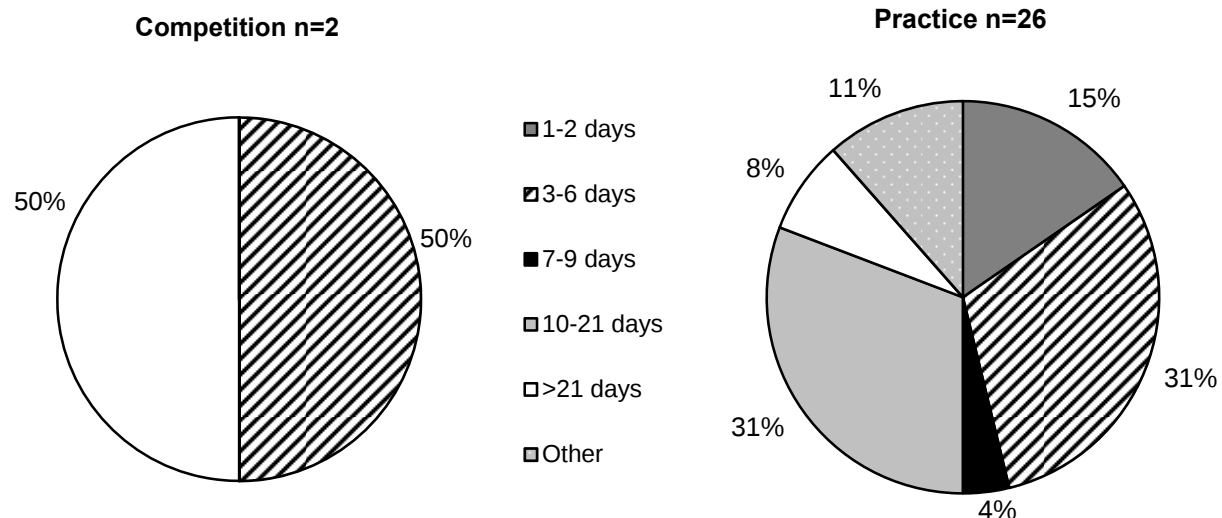
|                  | Competition |             | Practice  |             | Overall   |             |
|------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                  | n           | %           | n         | %           | n         | %           |
| <b>Body Site</b> |             |             |           |             |           |             |
| Shoulder         | ---         | 0.0%        | 11        | 42.3%       | 11        | 39.3%       |
| Trunk            | ---         | 0.0%        | 5         | 19.2%       | 5         | 17.9%       |
| Knee             | 1           | 50.0%       | 4         | 15.4%       | 5         | 17.9%       |
| Head/face        | 1           | 50.0%       | 2         | 7.7%        | 3         | 10.7%       |
| Ankle            | ---         | 0.0%        | 3         | 11.5%       | 3         | 10.7%       |
| Arm/elbow        | ---         | 0.0%        | 1         | 3.8%        | 1         | 3.6%        |
| <b>Total</b>     | <b>2</b>    | <b>100%</b> | <b>26</b> | <b>100%</b> | <b>28</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 19.4 Ten Most Common Girls' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Diagnosis              | Competition<br>n=2 |       | Practice<br>n=26 |       | Total<br>n=28 |       |
|------------------------|--------------------|-------|------------------|-------|---------------|-------|
|                        | n                  | %     | n                | %     | n             | %     |
| Shoulder other         | ---                | 0.0%  | 6                | 23.1% | 6             | 21.4% |
| Shoulder strain/sprain | ---                | 0.0%  | 5                | 19.2% | 5             | 17.9% |
| Head/face concussion   | 1                  | 50.0% | 2                | 7.7%  | 3             | 10.7% |
| Knee other             | 1                  | 50.0% | 2                | 7.7%  | 3             | 10.7% |
| Trunk strain/sprain    | ---                | 0.0%  | 2                | 7.7%  | 2             | 7.1%  |
| Trunk other            | ---                | 0.0%  | 2                | 7.7%  | 2             | 7.1%  |
| Ankle strain/sprain    | ---                | 0.0%  | 2                | 7.7%  | 2             | 7.1%  |
| Knee strain/sprain     | ---                | 0.0%  | 2                | 7.7%  | 2             | 7.1%  |
| Trunk contusion        | ---                | 0.0%  | 1                | 3.8%  | 1             | 3.6%  |
| Arm/elbow other        | ---                | 0.0%  | 1                | 3.8%  | 1             | 3.6%  |
| Ankle other            | ---                | 0.0%  | 1                | 3.8%  | 1             | 3.6%  |

**Figure 19.2 Time Loss of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



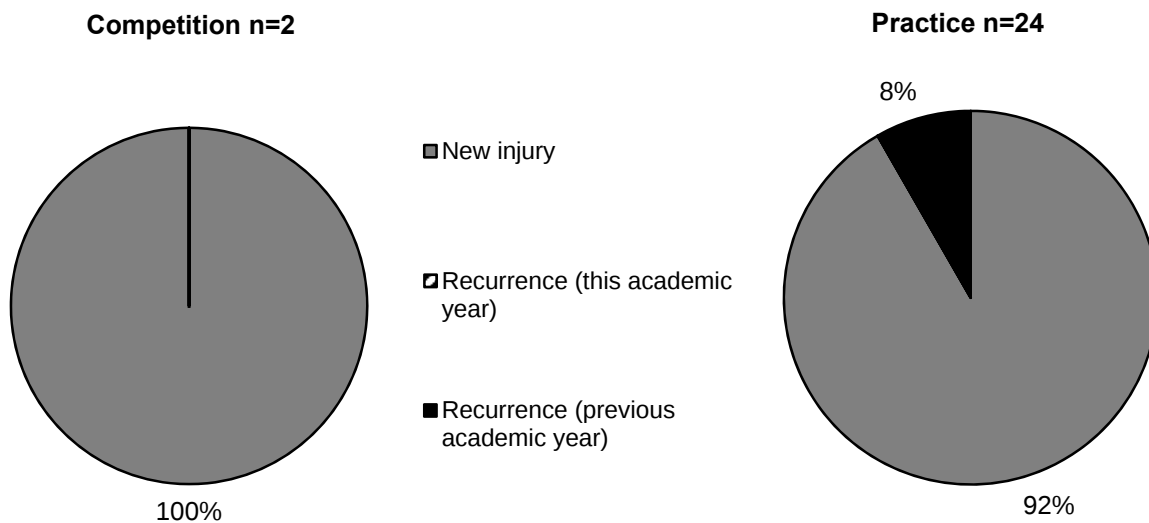
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 19.5 Girls' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |           |             |
| Required surgery        | 1           | 50.0%       | 5         | 19.2%       | 6         | 21.4%       |
| Did not require surgery | 1           | 50.0%       | 21        | 80.8%       | 22        | 78.6%       |
| <b>Total</b>            | <b>2</b>    | <b>100%</b> | <b>26</b> | <b>100%</b> | <b>28</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 19.3 History of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 19.6 Time during Season of Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 5         | 18.5%       |
| Regular season        | 22        | 81.5%       |
| Post season           | ---       | 0.0%        |
| <b>Total</b>          | <b>27</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 19.7 Competition-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                | n         | %           |
|--------------------------------|-----------|-------------|
| <b>Pool Location</b>           |           |             |
| In pool                        | 23        | 85.2%       |
| Starting platform/board/blocks | 2         | 7.4%        |
| Poolside                       | 1         | 3.7%        |
| Other                          | 1         | 3.7%        |
| <b>Total</b>                   | <b>27</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 19.8 Practice-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 4         | 15.4%       |
| Second 1/2 hour         | 2         | 7.7%        |
| 1-2 hours into practice | 18        | 69.2%       |
| >2 hours into practice  | 2         | 7.7%        |
| <b>Total</b>            | <b>26</b> | <b>100%</b> |

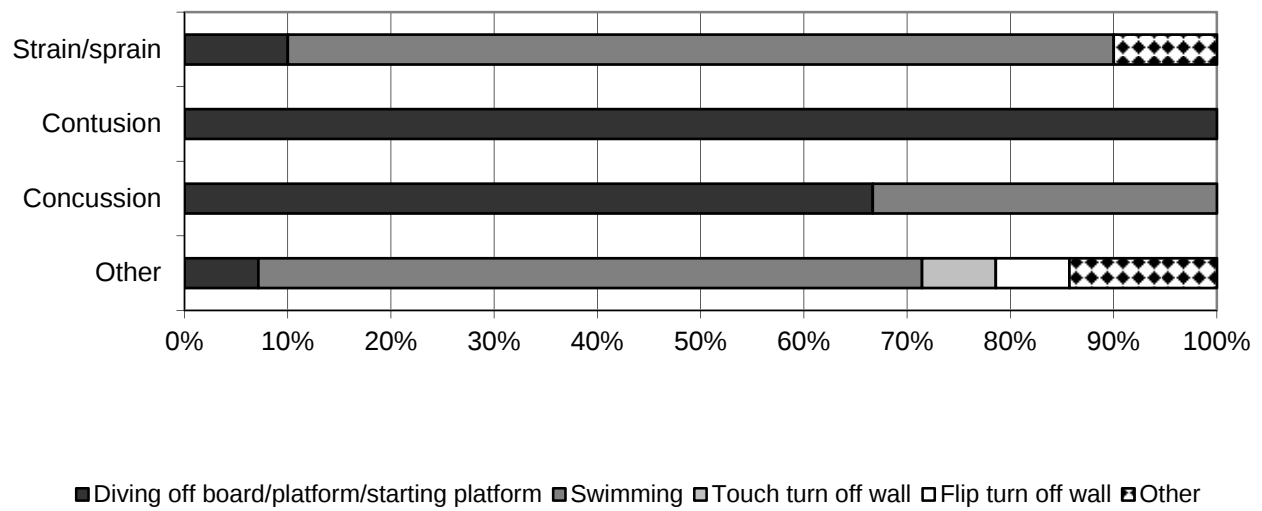
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 19.9 Activities Leading to Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                        | Competition |             | Practice  |             | Overall   |             |
|---------------------------------|-------------|-------------|-----------|-------------|-----------|-------------|
|                                 | n           | %           | n         | %           | n         | %           |
| Swimming                        | 2           | 100.0%      | 16        | 61.5%       | 18        | 64.3%       |
| Diving off board/platform/block | ---         | 0.0%        | 5         | 19.2%       | 5         | 17.9%       |
| Flip turn off wall              | ---         | 0.0%        | 1         | 3.8%        | 1         | 3.6%        |
| Touch turn off wall             | ---         | 0.0%        | 1         | 3.8%        | 1         | 3.6%        |
| Other                           | ---         | 0.0%        | 3         | 11.5%       | 3         | 10.7%       |
| <b>Total</b>                    | <b>2</b>    | <b>100%</b> | <b>26</b> | <b>100%</b> | <b>28</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 19.4 Activity Resulting in Girls' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XX. Boys' Track and Field Injury Epidemiology**

**Table 20.1 Boys' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-exposures) |
|--------------|------------|----------------|----------------------------------------------|
| <b>Total</b> | <b>165</b> | <b>221,672</b> | <b>0.74</b>                                  |
| Competition  | 52         | 44,889         | 1.16                                         |
| Practice     | 113        | 176,783        | 0.64                                         |

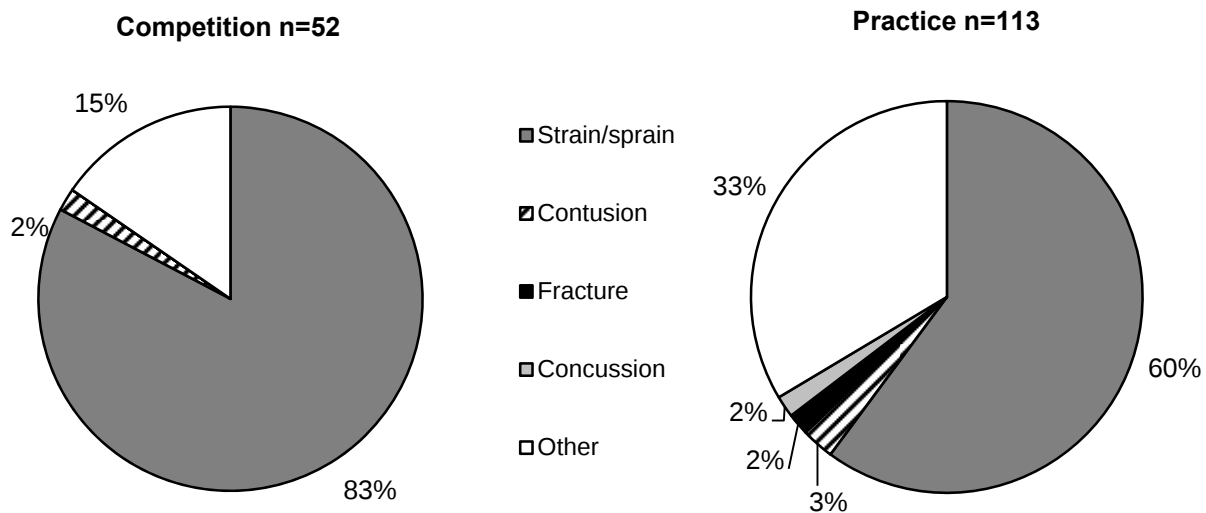
**Table 20.2 Demographic Characteristics of Injured Boys' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=162</b> |
| Freshman                 | 15.4%        |
| Sophomore                | 20.4%        |
| Junior                   | 33.3%        |
| Senior                   | 30.9%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 19           |
| Mean (St. Dev.)          | 16.3 (1.3)   |
| <b>BMI</b>               |              |
| Minimum                  | 18.0         |
| Maximum                  | 42.6         |
| Mean (St. Dev.)          | 23.3 (3.7)   |

\*All analyses in this chapter present un-weighted data.

<sup>†</sup>Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 20.1 Diagnosis of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 20.3 Body Site of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

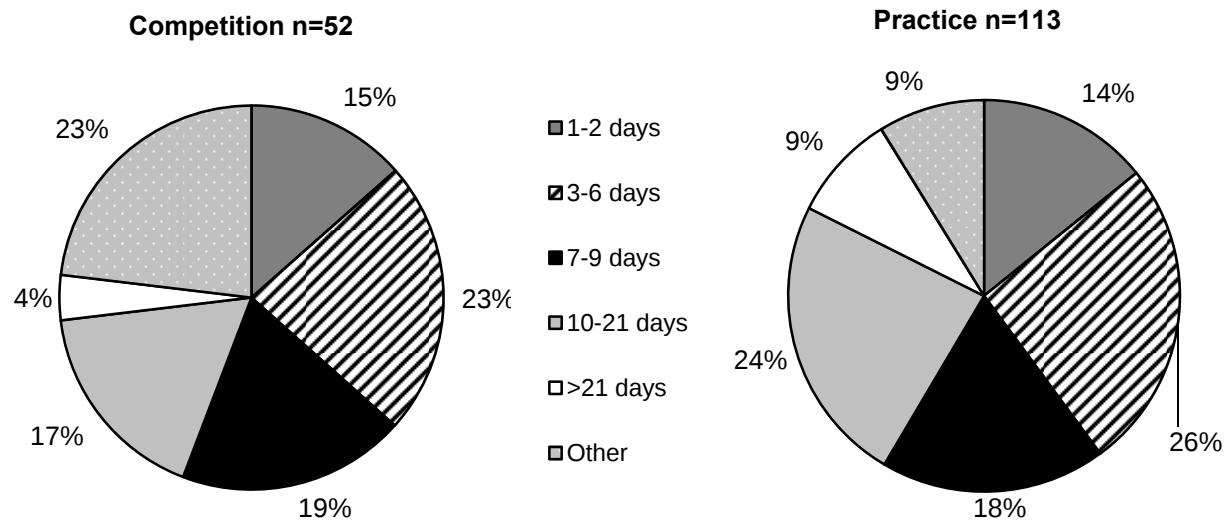
|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Hip/thigh/upper leg | 35          | 67.3%       | 46         | 40.7%       | 81         | 49.1%       |
| Lower leg           | 2           | 3.8%        | 23         | 20.4%       | 25         | 15.2%       |
| Ankle               | 4           | 7.7%        | 15         | 13.3%       | 19         | 11.5%       |
| Knee                | 2           | 3.8%        | 9          | 8.0%        | 11         | 6.7%        |
| Trunk               | 3           | 5.8%        | 6          | 5.3%        | 9          | 5.5%        |
| Foot                | 3           | 5.8%        | 5          | 4.4%        | 8          | 4.8%        |
| Shoulder            | 2           | 3.8%        | 2          | 1.8%        | 4          | 2.4%        |
| Head/face           | ---         | 0.0%        | 3          | 2.7%        | 3          | 1.8%        |
| Arm/elbow           | ---         | 0.0%        | 2          | 1.8%        | 2          | 1.2%        |
| Hand/wrist          | ---         | 0.0%        | ---        | 0.0%        | ---        | 0.0%        |
| Neck                | ---         | 0.0%        | ---        | 0.0%        | ---        | 0.0%        |
| Other               | 1           | 1.9%        | 2          | 1.8%        | 3          | 1.8%        |
| <b>Total</b>        | <b>52</b>   | <b>100%</b> | <b>113</b> | <b>100%</b> | <b>165</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 20.4 Ten Most Common Boys' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Competition<br>n=52 |       | Practice<br>n=113 |       | Total<br>n=165 |       |
|-----------------------------------|---------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                   | %     | n                 | %     | n              | %     |
| <b>Diagnosis</b>                  |                     |       |                   |       |                |       |
| Hip/thigh/upper leg strain/sprain | 32                  | 61.5% | 39                | 34.5% | 71             | 43.0% |
| Lower leg other                   | 1                   | 1.9%  | 18                | 15.9% | 19             | 11.5% |
| Ankle strain/sprain               | 4                   | 7.7%  | 14                | 12.4% | 18             | 10.9% |
| Hip/thigh/upper leg other         | 2                   | 3.8%  | 7                 | 6.2%  | 9              | 5.5%  |
| Knee other                        | 2                   | 3.8%  | 6                 | 5.3%  | 8              | 4.8%  |
| Trunk strain/sprain               | 2                   | 3.8%  | 4                 | 3.5%  | 6              | 3.6%  |
| Foot strain/sprain                | 3                   | 5.8%  | 2                 | 1.8%  | 5              | 3.0%  |
| Lower leg strain/sprain           | 1                   | 1.9%  | 3                 | 2.7%  | 4              | 2.4%  |
| Shoulder strain/sprain            | 1                   | 1.9%  | 2                 | 1.8%  | 3              | 1.8%  |
| Foot other                        | ---                 | 0.0%  | 3                 | 2.7%  | 3              | 1.8%  |

**Figure 20.2 Time Loss of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



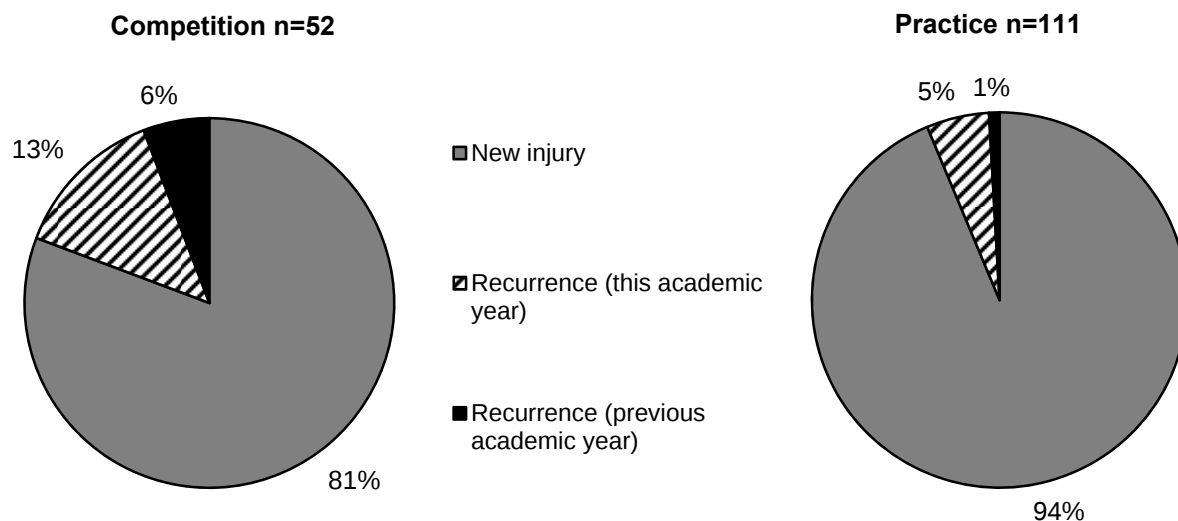
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 20.5 Boys' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | ---         | 0.0%        | 2          | 1.8%        | 2          | 1.2%        |
| Did not require surgery | 50          | 100%        | 110        | 98.2%       | 160        | 98.8%       |
| <b>Total</b>            | <b>50</b>   | <b>100%</b> | <b>112</b> | <b>100%</b> | <b>162</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 20.3 History of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 20.6 Time during Season of Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 37         | 22.6%       |
| Regular season        | 120        | 73.2%       |
| Post season           | 7          | 4.3%        |
| <b>Total</b>          | <b>164</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 20.7 Practice-Related Variables for Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 23         | 21.5%       |
| Second 1/2 hour         | 29         | 27.1%       |
| 1-2 hours into practice | 48         | 44.9%       |
| >2 hours into practice  | 7          | 6.5%        |
| <b>Total</b>            | <b>107</b> | <b>100%</b> |

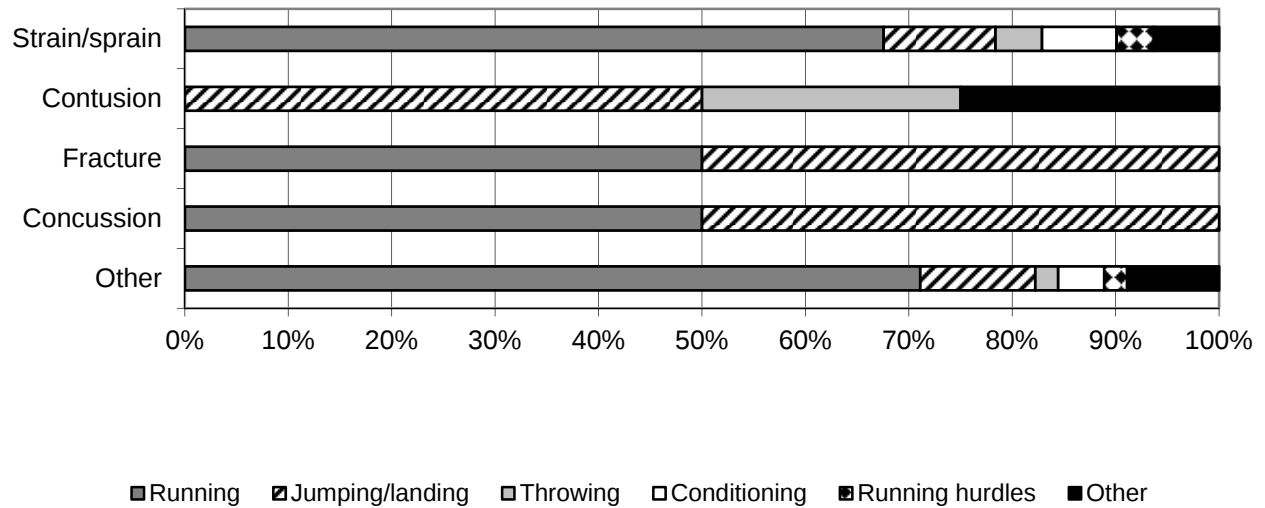
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 20.8 Activities Leading to Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity                              | Competition |             | Practice   |             | Overall    |             |
|---------------------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                                       | n           | %           | n          | %           | n          | %           |
| Running                               | 33          | 63.5%       | 76         | 67.9%       | 109        | 66.5%       |
| Jumping/landing                       | 8           | 15.4%       | 13         | 11.6%       | 21         | 12.8%       |
| Conditioning                          | ---         | 0.0%        | 10         | 8.9%        | 10         | 6.1%        |
| Throwing                              | 4           | 7.7%        | 3          | 2.7%        | 7          | 4.3%        |
| Running hurdles                       | 3           | 5.8%        | 2          | 1.8%        | 5          | 3.0%        |
| Warming up                            | ---         | 0.0%        | 3          | 2.7%        | 3          | 1.8%        |
| Leaving block                         | 1           | 1.9%        | 1          | 0.9%        | 2          | 1.2%        |
| Baton hand off                        | 2           | 3.8%        | --         | 0.0%        | 2          | 1.2%        |
| Hit by shot put/discus/javelin/hammer | ---         | 0.0%        | 1          | 0.9%        | 1          | 0.6%        |
| Other                                 | 1           | 1.9%        | 3          | 2.7%        | 4          | 2.4%        |
| <b>Total</b>                          | <b>52</b>   | <b>100%</b> | <b>112</b> | <b>100%</b> | <b>164</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 20.4 Activity Resulting in Boys' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XXI. Girls' Track and Field Injury Epidemiology**

**Table 21.1 Girls' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>179</b> | <b>193,123</b> | <b>0.93</b>                                      |
| Competition  | 42         | 39,193         | 1.07                                             |
| Practice     | 137        | 153,930        | 0.89                                             |

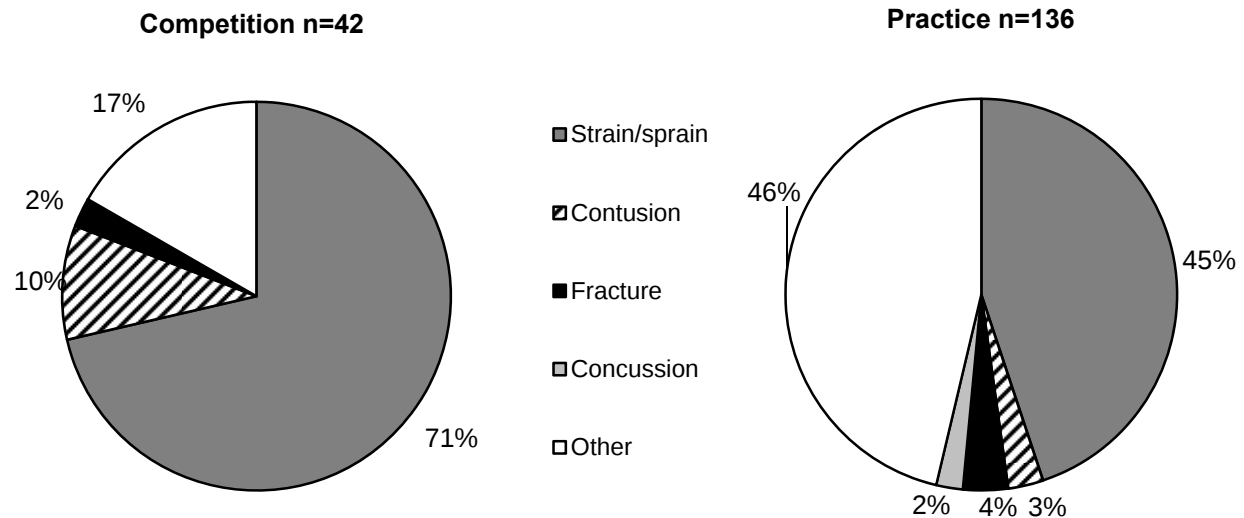
**Table 21.2 Demographic Characteristics of Injured Girls' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |              |
|--------------------------|--------------|
| <b>Year in School</b>    | <b>n=178</b> |
| Freshman                 | 38.8%        |
| Sophomore                | 22.5%        |
| Junior                   | 18.0%        |
| Senior                   | 20.8%        |
| <b>Total<sup>†</sup></b> | <b>100%</b>  |
| <b>Age (years)</b>       |              |
| Minimum                  | 13           |
| Maximum                  | 19           |
| Mean (St. Dev.)          | 15.7 (1.4)   |
| <b>BMI</b>               |              |
| Minimum                  | 16.0         |
| Maximum                  | 38.4         |
| Mean (St. Dev.)          | 21.2 (3.2)   |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 21.1 Diagnosis of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 21.3 Body Site of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

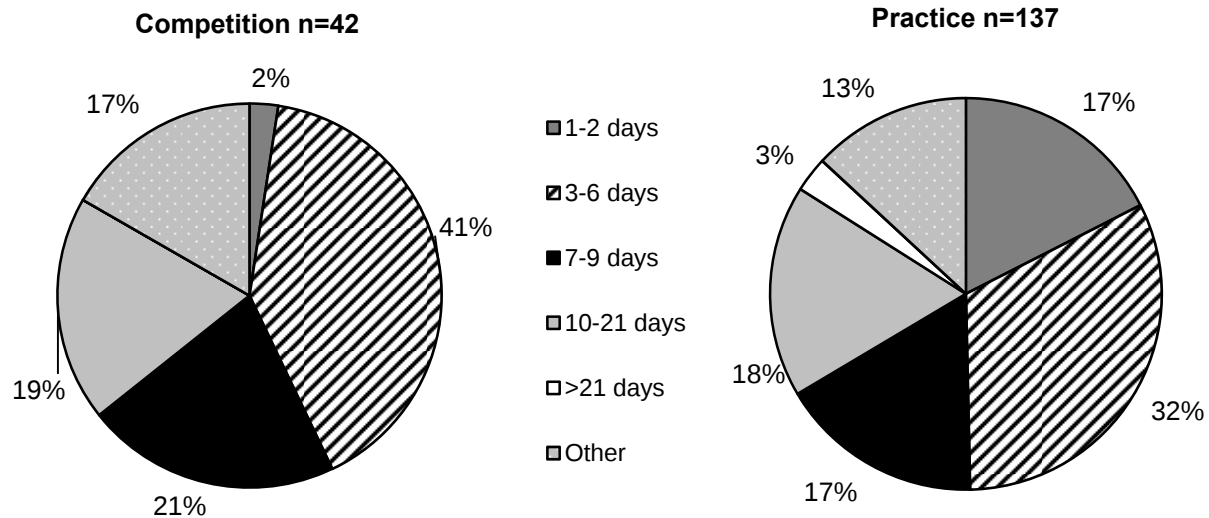
|                     | Competition |             | Practice   |             | Overall    |             |
|---------------------|-------------|-------------|------------|-------------|------------|-------------|
|                     | n           | %           | n          | %           | n          | %           |
| <b>Body Site</b>    |             |             |            |             |            |             |
| Hip/thigh/upper leg | 14          | 33.3%       | 48         | 35.0%       | 62         | 34.6%       |
| Lower leg           | 6           | 14.3%       | 36         | 26.3%       | 42         | 23.5%       |
| Knee                | 5           | 11.9%       | 17         | 12.4%       | 22         | 12.3%       |
| Ankle               | 7           | 16.7%       | 13         | 9.5%        | 20         | 11.2%       |
| Foot                | 2           | 4.8%        | 13         | 9.5%        | 15         | 8.4%        |
| Trunk               | 5           | 11.9%       | 2          | 1.5%        | 7          | 3.9%        |
| Head/face           | ---         | 0.0%        | 3          | 2.2%        | 3          | 1.7%        |
| Shoulder            | 1           | 2.4%        | 2          | 1.5%        | 3          | 1.7%        |
| Hand/wrist          | 1           | 2.4%        | 2          | 1.5%        | 3          | 1.7%        |
| Arm/elbow           | 1           | 2.4%        | ---        | 0.0%        | 1          | 0.6%        |
| Neck                | ---         | 0.0%        | 1          | 0.7%        | 1          | 0.6%        |
| <b>Total</b>        | <b>42</b>   | <b>100%</b> | <b>137</b> | <b>100%</b> | <b>179</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 21.4 Ten Most Common Girls' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Competition<br>n=42 |       | Practice<br>n=136 |       | Total<br>n=178 |       |
|-----------------------------------|---------------------|-------|-------------------|-------|----------------|-------|
|                                   | n                   | %     | n                 | %     | n              | %     |
| <b>Diagnosis</b>                  |                     |       |                   |       |                |       |
| Hip/thigh/upper leg strain/sprain | 13                  | 31.0% | 40                | 29.4% | 53             | 29.8% |
| Lower leg other                   | 2                   | 4.8%  | 32                | 23.5% | 34             | 19.1% |
| Knee other                        | 3                   | 7.1%  | 14                | 10.3% | 17             | 9.6%  |
| Ankle strain/sprain               | 7                   | 16.7% | 9                 | 6.6%  | 16             | 9.0%  |
| Hip/thigh/upper leg other         | ---                 | 0.0%  | 8                 | 5.9%  | 8              | 4.5%  |
| Lower leg strain/sprain           | 4                   | 9.5%  | 3                 | 2.2%  | 7              | 3.9%  |
| Foot other                        | 1                   | 2.4%  | 4                 | 2.9%  | 5              | 2.8%  |
| Knee strain/sprain                | 1                   | 2.4%  | 2                 | 1.5%  | 3              | 1.7%  |
| Foot strain/sprain                | ---                 | 0.0%  | 3                 | 2.2%  | 3              | 1.7%  |
| Head/face concussion              | ---                 | 0.0%  | 3                 | 2.2%  | 3              | 1.7%  |

**Figure 21.2 Time Loss of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



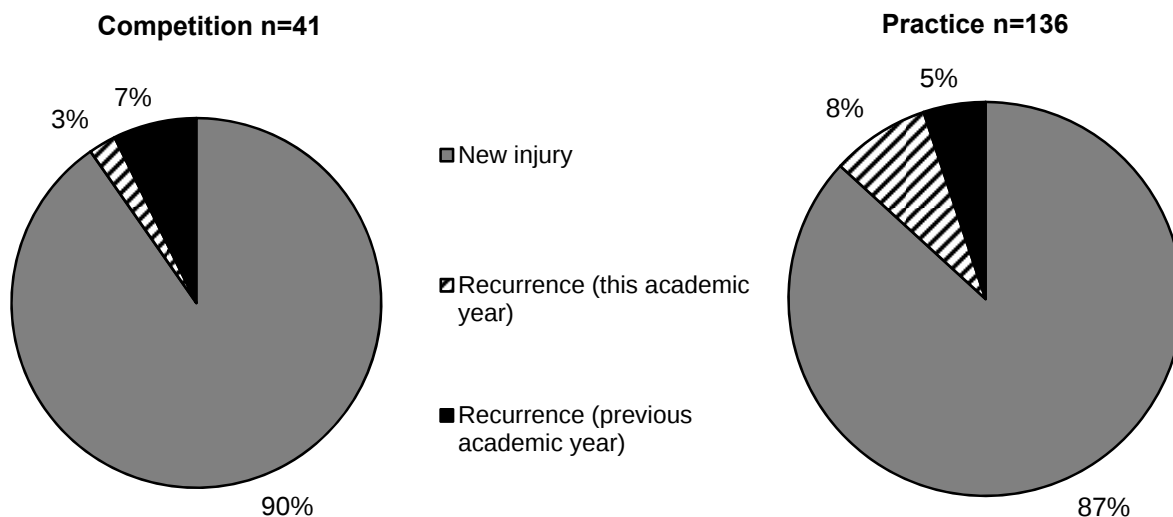
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 21.5 Girls' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice   |             | Overall    |             |
|-------------------------|-------------|-------------|------------|-------------|------------|-------------|
|                         | n           | %           | n          | %           | n          | %           |
| <b>Need for surgery</b> |             |             |            |             |            |             |
| Required surgery        | 2           | 4.8%        | 7          | 5.2%        | 9          | 5.1%        |
| Did not require surgery | 40          | 95.2%       | 127        | 94.8%       | 167        | 94.9%       |
| <b>Total</b>            | <b>42</b>   | <b>100%</b> | <b>134</b> | <b>100%</b> | <b>176</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 21.3 History of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 21.6 Time during Season of Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n          | %           |
|-----------------------|------------|-------------|
| <b>Time in Season</b> |            |             |
| Preseason             | 44         | 24.7%       |
| Regular season        | 132        | 74.2%       |
| Post season           | 2          | 1.1%        |
| <b>Total</b>          | <b>178</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 21.7 Practice-Related Variables for Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n          | %           |
|-------------------------|------------|-------------|
| <b>Time in Practice</b> |            |             |
| First 1/2 hour          | 21         | 16.7%       |
| Second 1/2 hour         | 32         | 25.4%       |
| 1-2 hours into practice | 62         | 49.2%       |
| >2 hours into practice  | 11         | 8.7%        |
| <b>Total</b>            | <b>126</b> | <b>100%</b> |

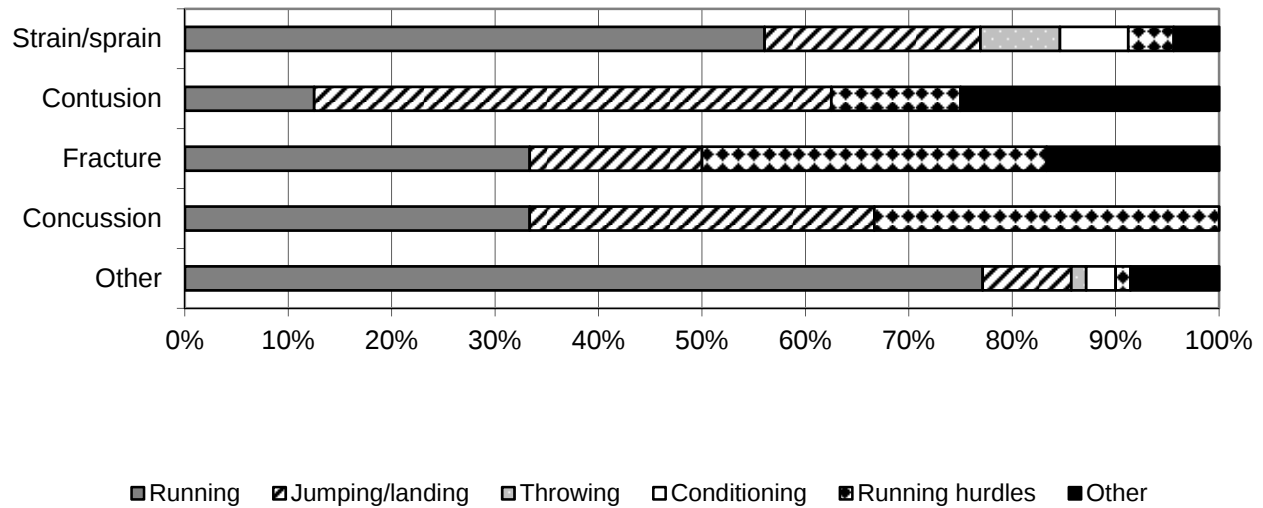
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 21.8 Activities Leading to Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                 | Competition |             | Practice   |             | Overall    |             |
|-----------------|-------------|-------------|------------|-------------|------------|-------------|
|                 | n           | %           | n          | %           | n          | %           |
| <b>Activity</b> |             |             |            |             |            |             |
| Running         | 20          | 47.6%       | 90         | 65.7%       | 110        | 61.5%       |
| Jumping/landing | 11          | 26.2%       | 20         | 14.6%       | 31         | 17.3%       |
| Running hurdles | 3           | 7.1%        | 6          | 4.4%        | 9          | 5.0%        |
| Conditioning    | ---         | 0.0%        | 8          | 5.8%        | 8          | 4.5%        |
| Throwing        | 4           | 9.5%        | 4          | 2.9%        | 8          | 4.5%        |
| Warming up      | 1           | 2.4%        | 6          | 4.4%        | 7          | 3.9%        |
| Other           | 3           | 7.2%        | 3          | 2.2%        | 6          | 3.4%        |
| <b>Total</b>    | <b>42</b>   | <b>100%</b> | <b>137</b> | <b>100%</b> | <b>179</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 21.4 Activity Resulting in Girls' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



## **XXII. Cheerleading Injury Epidemiology**

**Table 22.1 Cheerleading Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | # Injuries | # Exposures    | Injury rate<br>(per 1,000 athlete-<br>exposures) |
|--------------|------------|----------------|--------------------------------------------------|
| <b>Total</b> | <b>98</b>  | <b>172,994</b> | <b>0.57</b>                                      |
| Competition  | 8          | 11,956         | 0.67                                             |
| Practice     | 75         | 128,247        | 0.58                                             |
| Performance  | 15         | 32,791         | 0.46                                             |

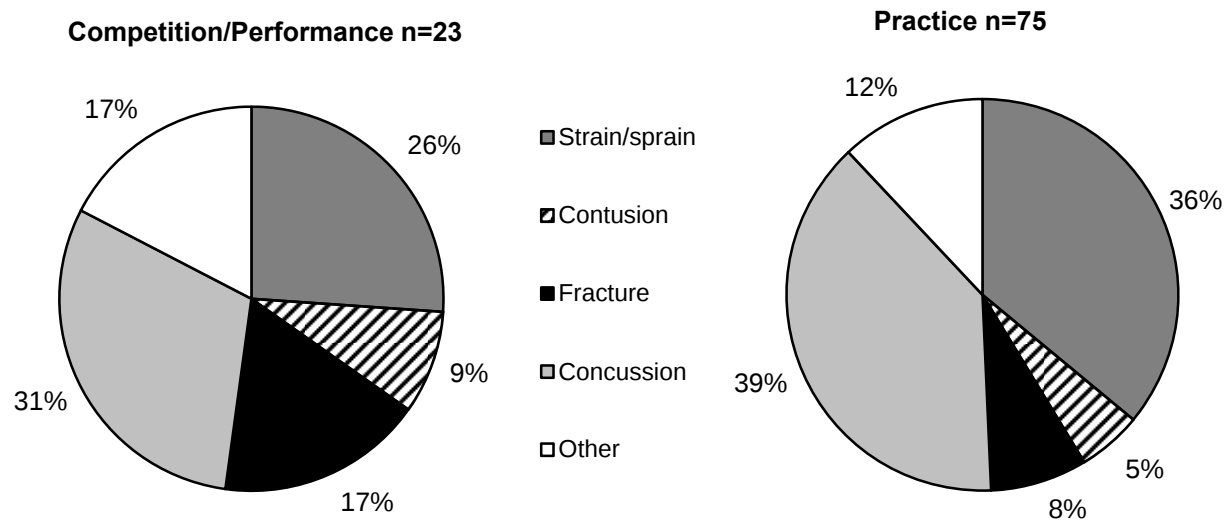
**Table 22.2 Demographic Characteristics of Injured Cheerleading Athletes, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year\***

|                          |             |
|--------------------------|-------------|
| <b>Year in School</b>    | <b>n=97</b> |
| Freshman                 | 14.4%       |
| Sophomore                | 38.1%       |
| Junior                   | 25.8%       |
| Senior                   | 21.6%       |
| <b>Total<sup>†</sup></b> | <b>100%</b> |
| <b>Age (years)</b>       |             |
| Minimum                  | 12          |
| Maximum                  | 18          |
| Mean (St. Dev.)          | 15.7 (1.1)  |
| <b>BMI</b>               |             |
| Minimum                  | 17.0        |
| Maximum                  | 30.3        |
| Mean (St. Dev.)          | 21.3 (2.6)  |

\*All analyses in this chapter present un-weighted data.

†Throughout this report, totals and n's represent the total un-weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Figure 22.1 Diagnosis of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 22.3 Body Site of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

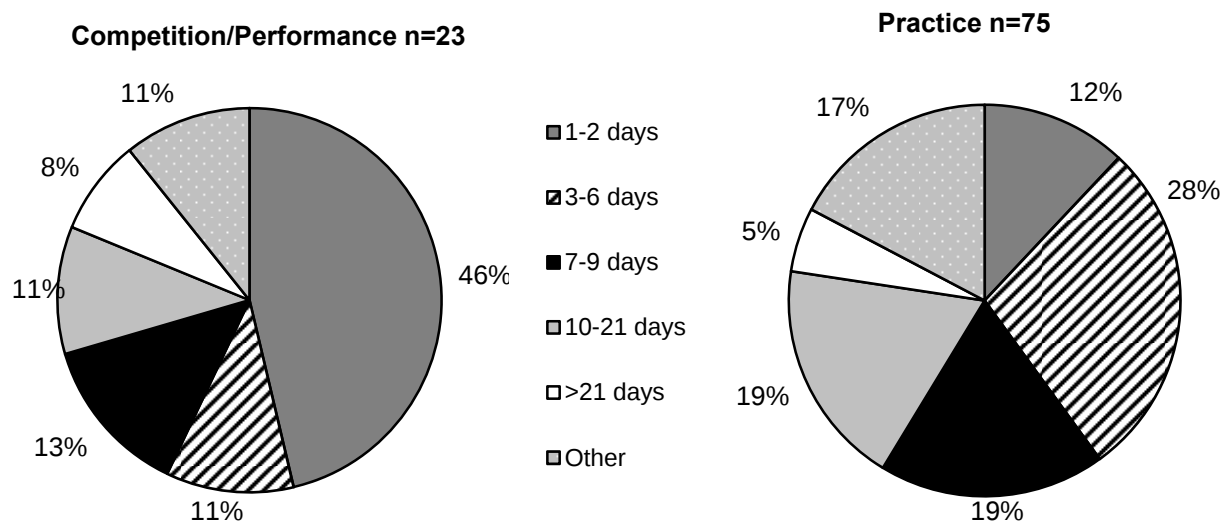
|                     | Competition |             | Practice  |             | Performance |             | Overall   |             |
|---------------------|-------------|-------------|-----------|-------------|-------------|-------------|-----------|-------------|
|                     | n           | %           | n         | %           | n           | %           | n         | %           |
| <b>Body Site</b>    |             |             |           |             |             |             |           |             |
| Head/face           | 5           | 62.5%       | 35        | 46.7%       | 3           | 20.0%       | 43        | 43.9%       |
| Hand/wrist          | ---         | 0.0%        | 8         | 10.7%       | 2           | 13.3%       | 10        | 10.2%       |
| Knee                | ---         | 0.0%        | 3         | 4.0%        | 2           | 13.3%       | 5         | 5.1%        |
| Shoulder            | 1           | 12.5%       | 3         | 4.0%        | 1           | 6.7%        | 5         | 5.1%        |
| Ankle               | 1           | 12.5%       | 10        | 13.3%       | 1           | 6.7%        | 12        | 12.2%       |
| Arm/elbow           | ---         | 0.0%        | 3         | 4.0%        | 1           | 6.7%        | 4         | 4.1%        |
| Neck                | ---         | 0.0%        | 3         | 4.0%        | 1           | 6.7%        | 4         | 4.1%        |
| Hip/thigh/upper leg | ---         | 0.0%        | 2         | 2.7%        | 1           | 6.7%        | 3         | 3.1%        |
| Trunk               | 1           | 12.5%       | 4         | 5.3%        | ---         | 0.0%        | 5         | 5.1%        |
| Foot                | ---         | 0.0%        | 1         | 1.3%        | 2           | 13.3%       | 3         | 3.1%        |
| Lower leg           | ---         | 0.0%        | 2         | 2.7%        | ---         | 0.0%        | 2         | 2.0%        |
| Other               | ---         | 0.0%        | 1         | 1.3%        | 1           | 6.7%        | 2         | 2.0%        |
| <b>Total</b>        | <b>8</b>    | <b>100%</b> | <b>75</b> | <b>100%</b> | <b>15</b>   | <b>100%</b> | <b>98</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 22.4 Ten Most Common Cheerleading Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Competition<br>n=8 |       | Practice<br>n=75 |       | Performance<br>n=15 |       | Total<br>n=98 |       |
|-----------------------------------|--------------------|-------|------------------|-------|---------------------|-------|---------------|-------|
|                                   | n                  | %     | n                | %     | n                   | %     | n             | %     |
| <b>Diagnosis</b>                  |                    |       |                  |       |                     |       |               |       |
| Head/face concussion              | 4                  | 50.0% | 29               | 38.7% | 3                   | 20.0% | 36            | 36.7% |
| Ankle strain/sprain               | 1                  | 12.5% | 10               | 13.3% | 1                   | 6.7%  | 12            | 12.2% |
| Hand/wrist strain/sprain          | ---                | 0.0%  | 6                | 8.0%  | ---                 | 0.0%  | 6             | 6.1%  |
| Hand/wrist fracture               | ---                | 0.0%  | 2                | 2.7%  | 2                   | 13.3% | 4             | 4.1%  |
| Neck strain/sprain                | ---                | 0.0%  | 3                | 4.0%  | 1                   | 6.7%  | 4             | 4.1%  |
| Trunk strain/sprain               | 1                  | 12.5% | 3                | 4.0%  | ---                 | 0.0%  | 4             | 4.1%  |
| Shoulder other                    | ---                | 0.0%  | 3                | 4.0%  | 1                   | 6.7%  | 4             | 4.1%  |
| Head/face contusion               | ---                | 0.0%  | 3                | 4.0%  | ---                 | 0.0%  | 3             | 3.1%  |
| Hip/thigh/upper leg strain/sprain | ---                | 0.0%  | 2                | 2.7%  | 1                   | 6.7%  | 3             | 3.1%  |
| Knee other                        | ---                | 0.0%  | 2                | 2.7%  | 1                   | 6.7%  | 3             | 3.1%  |

**Figure 22.2 Time Loss of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



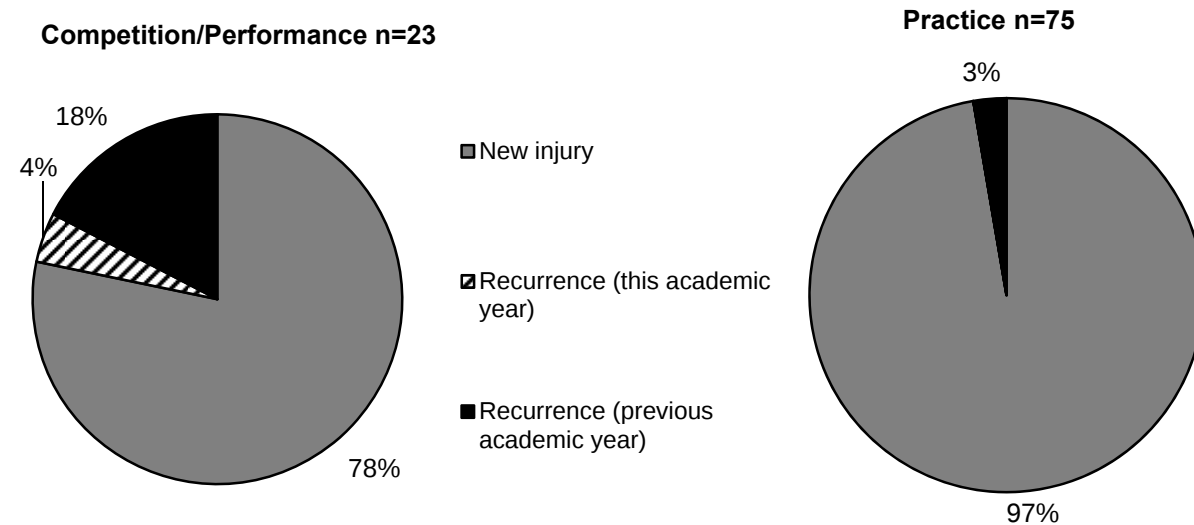
\*Other category is made up of medical disqualification for season, medical disqualification for career, athlete chooses not to continue, and season ended before athlete returned to play

**Table 22.5 Cheerleading Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Competition |             | Practice  |             | Performance |             | Overall   |             |
|-------------------------|-------------|-------------|-----------|-------------|-------------|-------------|-----------|-------------|
|                         | n           | %           | n         | %           | n           | %           | n         | %           |
| <b>Need for surgery</b> |             |             |           |             |             |             |           |             |
| Required surgery        | ---         | 0.0%        | 1         | 1.3%        | ---         | 0.0%        | 1         | 1.0%        |
| Did not require surgery | 8           | 100%        | 74        | 98.7%       | 15          | 100%        | 97        | 99.0%       |
| <b>Total</b>            | <b>8</b>    | <b>100%</b> | <b>75</b> | <b>100%</b> | <b>15</b>   | <b>100%</b> | <b>98</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 22.3 History of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



**Table 22.6 Time during Season of Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                       | n         | %           |
|-----------------------|-----------|-------------|
| <b>Time in Season</b> |           |             |
| Preseason             | 12        | 12.2%       |
| Regular season        | 81        | 82.7%       |
| Post season           | 5         | 5.1%        |
| <b>Total</b>          | <b>98</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 22.7 Practice-Related Variables for Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | n         | %           |
|-------------------------|-----------|-------------|
| <b>Time in Practice</b> |           |             |
| First 1/2 hour          | 10        | 14.3%       |
| Second 1/2 hour         | 19        | 27.1%       |
| 1-2 hours into practice | 38        | 54.3%       |
| >2 hours into practice  | 3         | 4.3%        |
| <b>Total</b>            | <b>70</b> | <b>100%</b> |

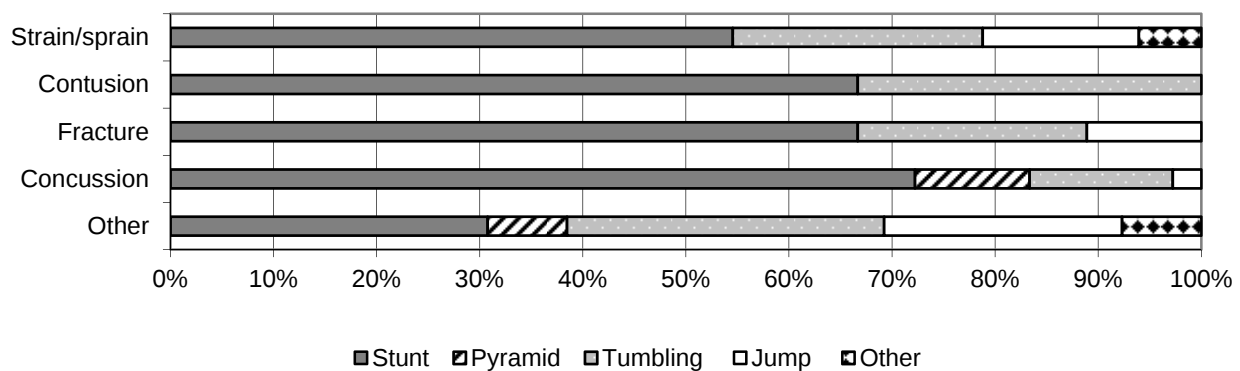
†Totals and n's are not always equal due to slight rounding or missing responses.

**Table 22.8 Activities Leading to Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

| Activity     | Competition |             | Practice  |             | Performance |             | Overall   |             |
|--------------|-------------|-------------|-----------|-------------|-------------|-------------|-----------|-------------|
|              | n           | %           | n         | %           | n           | %           | n         | %           |
| Stunt        | 3           | 37.5%       | 51        | 68.0%       | 4           | 28.6%       | 58        | 59.8%       |
| Tumbling     | 5           | 62.5%       | 11        | 14.7%       | 5           | 35.6%       | 21        | 21.6%       |
| Jump         | ---         | 0.0%        | 8         | 10.7%       | 2           | 14.3%       | 10        | 10.3%       |
| Pyramid      | ---         | 0.0%        | 3         | 4.0%        | 2           | 14.3%       | 5         | 5.2%        |
| Other        | ---         | 0.0%        | 2         | 2.7%        | 1           | 7.1%        | 3         | 3.1%        |
| <b>Total</b> | <b>8</b>    | <b>100%</b> | <b>75</b> | <b>100%</b> | <b>14</b>   | <b>100%</b> | <b>97</b> | <b>100%</b> |

†Totals and n's are not always equal due to slight rounding or missing responses.

**Figure 22.4 Activity Resulting in Cheerleading Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**



### **XXIII. Gender Differences within Sports**

### 23.1 Boys' and Girls' Soccer

**Table 23.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | Boys' soccer | Girls' soccer* | RR (95% CI) <sup>†</sup> |
|--------------|--------------|----------------|--------------------------|
| <b>Total</b> | 1.71         | <b>2.46</b>    | <b>1.44 (1.26, 1.64)</b> |
| Competition  | 3.67         | <b>5.46</b>    | <b>1.49 (1.26, 1.75)</b> |
| Practice     | 0.91         | <b>1.20</b>    | <b>1.32 (1.06, 1.65)</b> |

\*Throughout this chapter, rate ratios (RR) and injury proportion ratios (IPR) compare the gender with a higher injury rate/proportion (bolded) to the gender with a lower injury rate/proportion.

<sup>†</sup>Throughout this chapter, statistically significant RR and IPR are bolded.

**Table 23.10 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Boys' soccer | Girls' soccer | IPR (95% CI)             |
|---------------------|--------------|---------------|--------------------------|
| <b>Body Site</b>    |              |               |                          |
| Head/face           | 29.2%        | <b>30.8%</b>  | 1.06 (0.86, 1.29)        |
| Hip/thigh/upper leg | <b>18.1%</b> | 10.0%         | <b>1.82 (1.30, 2.55)</b> |
| Ankle               | 13.0%        | <b>21.4%</b>  | <b>1.65 (1.22, 2.23)</b> |
| Knee                | 12.0%        | <b>17.5%</b>  | <b>1.45 (1.05, 2.02)</b> |
| Foot                | <b>8.1%</b>  | 4.2%          | <b>1.95 (1.13, 3.34)</b> |
| Lower leg           | <b>5.9%</b>  | 6.0%          | 1.03 (0.61, 1.73)        |
| Hand/wrist          | <b>4.4%</b>  | 3.3%          | 1.33 (0.69, 2.57)        |
| Trunk               | <b>4.2%</b>  | 3.1%          | 1.34 (0.68, 2.64)        |
| Shoulder            | <b>2.2%</b>  | 1.2%          | 1.77 (0.64, 4.93)        |
| Arm/elbow           | 1.0%         | <b>1.0%</b>   | 1.06 (0.29, 3.92)        |
| Neck                | 0.7%         | <b>0.4%</b>   | 1.77 (0.30, 10.53)       |
| Other               | <b>1.2%</b>  | 1.0%          | 1.18 (0.34, 4.04)        |
| <b>Total</b>        | <b>100%</b>  | <b>100%</b>   | ---                      |

<sup>†</sup>Totals do not always equal 100% due to slight rounding.

**Table 23.11 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' soccer | Girls' soccer | IPR (95% CI)             |
|------------------|--------------|---------------|--------------------------|
| <b>Diagnosis</b> |              |               |                          |
| Strain/sprain    | 40.4%        | <b>42.6%</b>  | 1.06 (0.90, 1.24)        |
| Concussion       | 23.4%        | <b>28.9%</b>  | 1.24 (0.99, 1.55)        |
| Contusion        | <b>15.3%</b> | 10.8%         | 1.41 (1.00, 1.99)        |
| Fracture         | <b>7.4%</b>  | 4.0%          | <b>1.87 (1.07, 3.27)</b> |
| Other            | 13.5%        | <b>13.7%</b>  | 1.01 (0.73, 1.41)        |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>   | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.12 Most Common Boys' and Girls' Soccer Injury Diagnoses\*, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Boys' soccer | Girls' soccer | IPR (95% CI)             |
|-----------------------------------|--------------|---------------|--------------------------|
| <b>Diagnosis</b>                  |              |               |                          |
| Head/face concussion              | 23.3%        | <b>28.7%</b>  | 1.23 (0.98, 1.54)        |
| Hip/thigh/upper leg strain/sprain | <b>13.5%</b> | 8.7%          | <b>1.54 (1.06, 2.26)</b> |
| Ankle strain/sprain               | 11.5%        | <b>18.9%</b>  | <b>1.64 (1.19, 2.28)</b> |
| Knee strain/sprain                | 6.1%         | <b>10.0%</b>  | <b>1.63 (1.02, 2.59)</b> |

\*Only includes diagnoses accounting for >5% of boys' or girls' soccer injuries.

**Table 23.13 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' soccer | Girls' soccer | IPR (95% CI)             |
|------------------|--------------|---------------|--------------------------|
| <b>Time Loss</b> |              |               |                          |
| 1-2 days         | <b>14.7%</b> | 11.9%         | 1.24 (0.89, 1.74)        |
| 3-6 days         | <b>28.9%</b> | 20.0%         | <b>1.45 (1.15, 1.83)</b> |
| 7-9 days         | 15.2%        | <b>16.0%</b>  | 1.05 (0.78, 1.43)        |
| 10-21 days       | 18.1%        | <b>22.7%</b>  | 1.25 (0.96, 1.63)        |
| 22 days or more  | 4.7%         | <b>5.2%</b>   | 1.12 (0.62, 2.00)        |
| Other            | 18.4%        | <b>24.3%</b>  | 1.32 (1.02, 1.71)        |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>   | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.14 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                 | Boys' soccer | Girls' soccer | IPR (95% CI)             |
|-------------------------------------------------|--------------|---------------|--------------------------|
| <b>Soccer Mechanism</b>                         |              |               |                          |
| Contact with another player                     | <b>30.5%</b> | 28.8%         | 1.06 (0.86, 1.30)        |
| N/A (overuse, heat illness, conditioning, etc.) | <b>15.5%</b> | 14.2%         | 1.09 (0.79, 1.50)        |
| Stepped on/fell on/kicked                       | <b>14.0%</b> | 12.1%         | 1.16 (0.82, 1.64)        |
| Contact with ball                               | 12.5%        | <b>16.9%</b>  | 1.36 (0.98, 1.88)        |
| Rotation around planted foot/inversion          | 7.2%         | <b>12.1%</b>  | <b>1.67 (1.09, 2.55)</b> |
| Slide tackle                                    | 4.0%         | <b>4.7%</b>   | 1.17 (0.62, 2.19)        |
| Uneven playing surface                          | 1.3%         | <b>2.3%</b>   | 1.86 (0.65, 5.32)        |
| Contact with goal                               | <b>1.3%</b>  | 0.4%          | 2.95 (0.58, 15.12)       |
| Other                                           | <b>13.8%</b> | 8.5%          | <b>1.62 (1.10, 2.38)</b> |
| <b>Total</b>                                    | <b>100%</b>  | <b>100%</b>   | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.15 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                         | Boys' soccer | Girls' soccer | IPR (95% CI)       |
|-------------------------|--------------|---------------|--------------------|
| <b>Soccer Activity</b>  |              |               |                    |
| General play            | 22.7%        | <b>28.4%</b>  | 1.25 (0.99, 1.58)  |
| Defending               | 12.8%        | <b>13.4%</b>  | 1.05 (0.75, 1.49)  |
| Heading ball            | <b>11.7%</b> | 9.1%          | 1.29 (0.87, 1.91)  |
| Chasing loose ball      | <b>10.5%</b> | 7.6%          | 1.38 (0.90, 2.12)  |
| Ball handling/dribbling | 8.7%         | <b>9.3%</b>   | 1.08 (0.70, 1.65)  |
| Goaltending             | 6.6%         | <b>8.2%</b>   | 1.24 (0.77, 2.01)  |
| Shooting (foot)         | <b>6.4%</b>  | 5.2%          | 1.23 (0.71, 2.11)  |
| Passing (foot)          | 5.1%         | <b>5.6%</b>   | 1.11 (0.63, 1.95)  |
| Conditioning            | 4.8%         | <b>5.6%</b>   | 1.16 (0.65, 2.07)  |
| Receiving pass          | <b>4.3%</b>  | 2.6%          | 1.67 (0.81, 3.45)  |
| Blocking shot           | <b>3.3%</b>  | 2.2%          | 1.53 (0.68, 3.45)  |
| Attempting slide tackle | <b>1.5%</b>  | 0.2%          | 7.06 (0.85, 58.36) |
| Receiving slide tackle  | 0.5%         | <b>1.1%</b>   | 2.13 (0.42, 10.90) |
| Other                   | 1.0%         | <b>1.3%</b>   | 1.28 (0.36, 4.49)  |
| <b>Total</b>            | <b>100%</b>  | <b>100%</b>   | ---                |

†Totals do not always equal 100% due to slight rounding.

## 23.2 Boys' and Girls' Volleyball

**Table 23.2 Comparison of Boys' and Girls' Volleyball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | Boys' volleyball | Girls' volleyball | RR (95% CI)               |
|--------------|------------------|-------------------|---------------------------|
| <b>Total</b> | 0.53             | <b>1.07</b>       | <b>2.03 (1.11, 3.71)</b>  |
| Competition  | 1.07             | <b>1.37</b>       | 1.28 (0.62, 2.62)         |
| Practice     | 0.22             | <b>0.92</b>       | <b>4.12 (1.31, 12.88)</b> |

**Table 23.20 Comparison of Body Sites of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Boys' volleyball | Girls' volleyball | IPR (95% CI)       |
|---------------------|------------------|-------------------|--------------------|
| <b>Body Site</b>    |                  |                   |                    |
| Ankle               | <b>54.5%</b>     | 31.3%             | 1.74 (0.99, 3.08)  |
| Head/face           | <b>27.3%</b>     | 16.4%             | 1.66 (0.61, 4.53)  |
| Hand/wrist          | 9.1%             | <b>14.5%</b>      | 1.60 (0.24, 10.58) |
| Knee                | 9.1%             | <b>9.9%</b>       | 1.09 (0.16, 7.33)  |
| Trunk               | 0.0%             | <b>7.6%</b>       | ---                |
| Shoulder            | 0.0%             | <b>6.5%</b>       | ---                |
| Foot                | 0.0%             | <b>3.4%</b>       | ---                |
| Hip/thigh/upper leg | 0.0%             | <b>3.1%</b>       | ---                |
| Lower leg           | 0.0%             | <b>2.3%</b>       | ---                |
| Arm/elbow           | 0.0%             | <b>2.3%</b>       | ---                |
| Neck                | 0.0%             | <b>1.5%</b>       | ---                |
| Other               | 0.0%             | <b>1.1%</b>       | ---                |
| <b>Total</b>        | <b>100%</b>      | <b>100%</b>       | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.21 Comparison of Diagnoses of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' volleyball | Girls' volleyball | IPR (95% CI)       |
|------------------|------------------|-------------------|--------------------|
| <b>Diagnosis</b> |                  |                   |                    |
| Strain/sprain    | <b>63.6%</b>     | 53.8%             | 1.18 (0.75, 1.87)  |
| Concussion       | 18.2%            | <b>15.3%</b>      | 1.19 (0.33, 4.31)  |
| Fracture         | <b>9.1%</b>      | 4.2%              | 2.17 (0.31, 15.31) |
| Contusion        | 0.0%             | 4.6%              | ---                |
| Other            | 9.1%             | <b>22.1%</b>      | 2.44 (0.37, 16.0)  |
| <b>Total</b>     | <b>100%</b>      | <b>100%</b>       | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.22 Most Common Boys' and Girls' Volleyball Injury Diagnoses\*, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                          | Boys' volleyball | Girls' volleyball | IPR (95% CI)             |
|--------------------------|------------------|-------------------|--------------------------|
| <b>Diagnosis</b>         |                  |                   |                          |
| Ankle strain/sprain      | <b>54.5%</b>     | 30.2%             | <b>1.81 (1.02, 3.20)</b> |
| Hand/wrist strain/sprain | <b>9.1%</b>      | 8.8%              | 1.04 (0.15, 6.99)        |
| Knee fracture            | <b>9.1%</b>      | 0.0%              | ---                      |
| Knee other               | 0.0%             | <b>5.7%</b>       | ---                      |
| Shoulder other           | 0.0%             | <b>5.3%</b>       | ---                      |

\*Only includes diagnoses accounting for >5% of boys' or girls' Volleyball injuries.

**Table 23.23 Comparison of Time Loss of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' volleyball | Girls' volleyball | IPR (95% CI)       |
|------------------|------------------|-------------------|--------------------|
| <b>Time Loss</b> |                  |                   |                    |
| 1-2 days         | 18.2%            | <b>19.8%</b>      | 1.09 (0.30, 3.91)  |
| 3-6 days         | 9.1%             | <b>26.7%</b>      | 2.94 (0.45, 19.25) |
| 7-9 days         | <b>27.3%</b>     | 15.6%             | 1.74 (0.64, 4.76)  |
| 10-21 days       | 9.1%             | <b>19.5%</b>      | 2.14 (0.33, 14.10) |
| 22 days or more  | <b>9.1%</b>      | 4.2%              | 2.17 (0.31, 15.31) |
| Other            | <b>27.3%</b>     | 14.1%             | 1.93 (0.70, 5.30)  |
| <b>Total</b>     | <b>100%</b>      | <b>100%</b>       | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.24 Comparison of Mechanisms of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                 | Boys' volleyball | Girls' volleyball | IPR (95% CI)       |
|-------------------------------------------------|------------------|-------------------|--------------------|
| <b>Volleyball Mechanism</b>                     |                  |                   |                    |
| Contact with teammate                           | <b>27.3%</b>     | 16.2%             | 1.68 (0.62, 4.59)  |
| Jumping/landing                                 | 18.2%            | <b>20.8%</b>      | 1.15 (0.32, 4.11)  |
| Rotation around planted foot/inversion          | <b>18.2%</b>     | 5.4%              | 3.36 (0.87, 13.02) |
| Contact with ball                               | 9.1%             | <b>22.0%</b>      | 2.42 (0.37, 15.91) |
| Diving for ball                                 | <b>9.1%</b>      | 8.1%              | 1.12 (0.17, 7.60)  |
| Contact with opponent                           | <b>9.1%</b>      | 2.3%              | 3.92 (0.52, 29.86) |
| N/A (overuse, heat illness, conditioning, etc.) | 0.0%             | <b>19.3%</b>      | ---                |
| Contact with standard/pole                      | 0.0%             | <b>0.4%</b>       | ---                |
| Contact with seats/bleachers/table              | 0.0%             | <b>0.4%</b>       | ---                |
| Other                                           | <b>9.1%</b>      | 5.0%              | 1.81 (0.26, 12.63) |
| <b>Total</b>                                    | <b>100%</b>      | <b>100%</b>       | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.25 Comparison of Activities of Boys' and Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | Boys' volleyball | Girls' volleyball | IPR (95% CI)      |
|----------------------------|------------------|-------------------|-------------------|
| <b>Volleyball Activity</b> |                  |                   |                   |
| Digging                    | <b>36.4%</b>     | 17.1%             | 2.13 (0.93, 4.87) |
| General play               | 18.2%            | <b>25.6%</b>      | 1.41 (0.40, 5.01) |
| Blocking                   | 18.2%            | <b>21.7%</b>      | 1.19 (0.33, 4.27) |
| Spiking                    | <b>18.2%</b>     | 11.2%             | 1.62 (0.44, 5.93) |
| Setting                    | <b>9.1%</b>      | 6.6%              | 1.38 (0.20, 9.45) |
| Passing                    | 0.0%             | <b>6.2%</b>       | ---               |
| Conditioning               | 0.0%             | <b>3.5%</b>       | ---               |
| Serving                    | 0.0%             | <b>3.5%</b>       | ---               |
| Other                      | 0.0%             | <b>4.7%</b>       | ---               |
| <b>Total</b>               | <b>100%</b>      | <b>100%</b>       | ---               |

†Totals do not always equal 100% due to slight rounding.

### 23.3 Boys' and Girls' Basketball

**Table 23.3 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | Boys' basketball | Girls' basketball | RR (95% CI)              |
|--------------|------------------|-------------------|--------------------------|
| <b>Total</b> | 1.37             | <b>1.78</b>       | <b>1.30 (1.13, 1.49)</b> |
| Competition  | 2.57             | <b>3.51</b>       | <b>1.37 (1.14, 1.64)</b> |
| Practice     | 0.88             | <b>1.06</b>       | 1.21 (0.99, 1.49)        |

**Table 23.30 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Boys' basketball | Girls' basketball | IPR (95% CI)             |
|---------------------|------------------|-------------------|--------------------------|
| <b>Body Site</b>    |                  |                   |                          |
| Ankle               | <b>34.0%</b>     | 22.0%             | <b>1.54 (1.23, 1.93)</b> |
| Head/face           | 22.0%            | <b>25.1%</b>      | 1.14 (0.89, 1.46)        |
| Knee                | 13.4%            | <b>21.6%</b>      | <b>1.60 (1.18, 2.18)</b> |
| Hand/wrist          | 8.1%             | <b>9.2%</b>       | 1.15 (0.74, 1.78)        |
| Hip/thigh/upper leg | <b>5.9%</b>      | 5.5%              | 1.08 (0.62, 1.88)        |
| Trunk               | <b>5.9%</b>      | 4.3%              | 1.38 (0.76, 2.50)        |
| Lower leg           | 3.4%             | <b>3.8%</b>       | 1.11 (0.55, 2.24)        |
| Foot                | <b>2.9%</b>      | 2.4%              | 1.24 (0.54, 2.83)        |
| Shoulder            | 2.2%             | <b>3.3%</b>       | 1.51 (0.66, 3.45)        |
| Arm/elbow           | <b>2.0%</b>      | 1.4%              | 1.38 (0.48, 3.93)        |
| Neck                | 0.2%             | <b>0.5%</b>       | 1.94 (0.18, 21.30)       |
| Other               | 0.0%             | <b>0.9%</b>       | ---                      |
| <b>Total</b>        | <b>100%</b>      | <b>100%</b>       | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.31 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' basketball | Girls' basketball | IPR (95% CI)             |
|------------------|------------------|-------------------|--------------------------|
| <b>Diagnosis</b> |                  |                   |                          |
| Strain/sprain    | <b>49.0%</b>     | 47.3%             | 1.04 (0.90, 1.19)        |
| Concussion       | 14.9%            | <b>22.0%</b>      | <b>1.48 (1.10, 1.98)</b> |
| Fracture         | <b>8.5%</b>      | 5.0%              | 1.72 (1.02, 2.90)        |
| Contusion        | 8.3%             | <b>9.7%</b>       | 1.17 (0.76, 1.80)        |
| Other            | <b>19.3%</b>     | 16.1%             | 1.20 (0.89, 1.61)        |
| <b>Total</b>     | <b>100%</b>      | <b>100%</b>       | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.32 Most Common Boys' and Girls' Basketball Injury Diagnoses\*, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                          | Boys' basketball | Girls' basketball | IPR (95% CI)             |
|--------------------------|------------------|-------------------|--------------------------|
| <b>Diagnosis</b>         |                  |                   |                          |
| Ankle strain/sprain      | <b>32.7%</b>     | 21.3%             | <b>1.54 (1.22, 1.93)</b> |
| Head/face concussion     | 14.9%            | <b>22.0%</b>      | <b>1.48 (1.10, 1.98)</b> |
| Knee other               | 6.3%             | <b>6.9%</b>       | 1.08 (0.65, 1.80)        |
| Knee strain/sprain       | 5.4%             | <b>10.4%</b>      | <b>1.94 (1.18, 3.18)</b> |
| Hand/wrist strain/sprain | 3.9%             | <b>5.7%</b>       | 1.45 (0.78, 2.70)        |

\*Only includes diagnoses accounting for >5% of boys' or girls' basketball injuries.

**Table 23.33 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' basketball | Girls' basketball | IPR (95% CI)      |
|------------------|------------------|-------------------|-------------------|
| <b>Time Loss</b> |                  |                   |                   |
| 1-2 days         | <b>20.0%</b>     | 18.9%             | 1.06 (0.80, 1.39) |
| 3-6 days         | 22.2%            | 22.2%             | 1.00 (0.78, 1.29) |
| 7-9 days         | <b>14.6%</b>     | 14.4%             | 1.02 (0.73, 1.41) |
| 10-21 days       | <b>20.2%</b>     | 17.0%             | 1.19 (0.89, 1.58) |
| 22 days or more  | 6.8%             | <b>8.3%</b>       | 1.21 (0.75, 1.95) |
| Other            | 16.1%            | <b>19.1%</b>      | 1.19 (0.89, 1.60) |
| <b>Total</b>     | <b>100%</b>      | <b>100%</b>       | ---               |

†Totals do not always equal 100% due to slight rounding.

**Table 23.34 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                          | Boys' basketball | Girls' basketball | IPR (95% CI)             |
|------------------------------------------|------------------|-------------------|--------------------------|
| <b>Basketball Mechanism</b>              |                  |                   |                          |
| Collision with another player            | <b>32.5%</b>     | 30.8%             | 1.05 (0.86, 1.29)        |
| Jumping/landing                          | <b>24.1%</b>     | 15.9%             | <b>1.52 (1.15, 2.01)</b> |
| Stepped on/fell on/kicked                | <b>11.3%</b>     | 8.2%              | 1.38 (0.91, 2.11)        |
| Rotation around a planted foot/inversion | 10.3%            | <b>11.1%</b>      | 1.07 (0.72, 1.59)        |
| N/A (e.g., overuse, heat illness, etc.)  | 7.4%             | <b>13.7%</b>      | <b>1.86 (1.22, 2.83)</b> |
| Contact with ball                        | 3.4%             | <b>7.7%</b>       | <b>2.24 (1.21, 4.13)</b> |
| Other                                    | 10.8%            | <b>12.5%</b>      | 1.16 (0.79, 1.69)        |
| <b>Total</b>                             | <b>100%</b>      | <b>100%</b>       | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.35 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                            | Boys' basketball | Girls' basketball | IPR (95% CI)              |
|----------------------------|------------------|-------------------|---------------------------|
| <b>Basketball Activity</b> |                  |                   |                           |
| Rebounding                 | <b>24.7%</b>     | 16.2%             | <b>1.53 (1.15, 2.03)</b>  |
| General play               | 23.5%            | <b>27.6%</b>      | 1.29 (0.59, 2.81)         |
| Defending                  | 14.6%            | <b>18.7%</b>      | 1.27 (0.93, 1.74)         |
| Shooting                   | <b>12.4%</b>     | 5.7%              | <b>2.16 (1.34, 3.48)</b>  |
| Chasing loose ball         | <b>12.1%</b>     | 11.7%             | 1.04 (0.71, 1.51)         |
| Ball handling/dribbling    | 4.8%             | <b>8.0%</b>       | 1.66 (0.96, 2.88)         |
| Receiving pass             | 3.3%             | <b>4.2%</b>       | 1.29 (0.63, 2.62)         |
| Conditioning               | 1.0%             | <b>5.2%</b>       | <b>5.17 (1.79, 14.93)</b> |
| Other                      | <b>3.5%</b>      | 2.7%              | 1.29 (0.59, 2.81)         |
| <b>Total</b>               | <b>100%</b>      | <b>100%</b>       | ---                       |

†Totals do not always equal 100% due to slight rounding.

### 23.4 Boys' Baseball and Girls' Softball

**Table 23.4 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | Baseball | Softball    | RR (95% CI)              |
|--------------|----------|-------------|--------------------------|
| <b>Total</b> | 0.87     | <b>1.56</b> | <b>1.80 (1.48, 2.18)</b> |
| Competition  | 1.26     | <b>2.30</b> | <b>1.82 (1.39, 2.38)</b> |
| Practice     | 0.64     | <b>1.16</b> | <b>1.80 (1.36, 2.38)</b> |

**Table 23.40 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Baseball     | Softball     | IPR (95% CI)             |
|---------------------|--------------|--------------|--------------------------|
| <b>Body Site</b>    |              |              |                          |
| Head/face           | 22.0%        | <b>26.8%</b> | 1.22 (0.86, 1.72)        |
| Arm/elbow           | <b>15.9%</b> | 4.6%         | <b>3.46 (1.78, 6.74)</b> |
| Hand/wrist          | <b>12.6%</b> | 12.1%        | 1.04 (0.62, 1.74)        |
| Shoulder            | <b>11.0%</b> | 8.8%         | 1.25 (0.70, 2.24)        |
| Hip/thigh/upper leg | <b>9.9%</b>  | 8.4%         | 1.18 (0.64, 2.17)        |
| Ankle               | 8.2%         | <b>14.6%</b> | 1.78 (1.00, 3.15)        |
| Trunk               | <b>7.1%</b>  | 3.8%         | 1.90 (0.83, 4.34)        |
| Knee                | 6.0%         | <b>12.6%</b> | <b>2.08 (1.07, 4.03)</b> |
| Lower leg           | 3.3%         | <b>5.0%</b>  | 1.52 (0.58, 3.98)        |
| Foot                | <b>2.2%</b>  | 1.3%         | 1.75 (0.40, 7.73)        |
| Neck                | 1.1%         | <b>1.3%</b>  | 1.14 (0.19, 6.77)        |
| Other               | 0.5%         | <b>0.8%</b>  | 1.52 (0.14, 16.67)       |
| <b>Total</b>        | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.41 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Baseball     | Softball     | IPR (95% CI)             |
|------------------|--------------|--------------|--------------------------|
| <b>Diagnosis</b> |              |              |                          |
| Strain/sprain    | 35.9%        | <b>37.2%</b> | 1.04 (0.80, 1.34)        |
| Contusion        | 12.2%        | <b>18.0%</b> | 1.48 (0.92, 2.38)        |
| Concussion       | 11.6%        | <b>18.4%</b> | 1.59 (0.98, 2.57)        |
| Fracture         | <b>11.6%</b> | 10.9%        | 1.07 (0.62, 1.83)        |
| Other            | <b>28.7%</b> | 15.5%        | <b>1.86 (1.28, 2.70)</b> |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.42 Most Common Baseball and Softball Injury Diagnoses\*, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Baseball    | Softball     | IPR (95% CI)      |
|-----------------------------------|-------------|--------------|-------------------|
| <b>Diagnosis</b>                  |             |              |                   |
| Head/face concussion              | 11.5%       | <b>18.4%</b> | 1.60 (0.99, 2.59) |
| Hip/thigh/upper leg strain/sprain | <b>9.3%</b> | 5.9%         | 1.60 (0.81, 3.15) |
| Ankle strain/sprain               | 7.7%        | <b>11.7%</b> | 1.52 (0.83, 2.81) |
| Shoulder other                    | <b>6.6%</b> | 3.8%         | 1.75 (0.75, 4.07) |
| Hand/wrist fracture               | 6.0%        | <b>6.3%</b>  | 1.04 (0.49, 2.21) |

\*Only includes diagnoses accounting for >5% of baseball or softball injuries.

**Table 23.43 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Baseball     | Softball     | IPR (95% CI)      |
|------------------|--------------|--------------|-------------------|
| <b>Time Loss</b> |              |              |                   |
| 1-2 days         | <b>17.6%</b> | 15.1%        | 1.17 (0.76, 1.80) |
| 3-6 days         | 18.7%        | <b>25.5%</b> | 1.37 (0.94, 1.98) |
| 7-9 days         | 10.4%        | <b>13.0%</b> | 1.24 (0.73, 2.13) |
| 10-21 days       | <b>22.0%</b> | 17.2%        | 1.28 (0.87, 1.89) |
| 22 days or more  | <b>12.1%</b> | 7.9%         | 1.52 (0.85, 2.72) |
| Other            | 19.2%        | <b>21.3%</b> | 1.11 (0.76, 1.07) |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>  | ---               |

†Totals do not always equal 100% due to slight rounding.

**Table 23.44 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                 | Baseball     | Softball     | IPR (95% CI)              |
|-------------------------------------------------|--------------|--------------|---------------------------|
| <b>Baseball/Softball Mechanism</b>              |              |              |                           |
| Contact with another player                     | <b>14.4%</b> | 13.6%        | 1.06 (0.65, 1.70)         |
| Throwing - pitching                             | <b>14.4%</b> | 3.0%         | <b>4.82 (2.14, 10.86)</b> |
| N/A (overuse, heat illness, conditioning, etc.) | 10.5%        | <b>10.6%</b> | 1.01 (0.58, 1.78)         |
| Hit by batted ball                              | 9.4%         | <b>13.2%</b> | 1.41 (0.80, 2.46)         |
| Hit by pitch                                    | <b>8.3%</b>  | 3.4%         | <b>2.43 (1.06, 5.62)</b>  |
| Contact with bases                              | 7.2%         | <b>12.8%</b> | 1.78 (0.96, 3.31)         |
| Contact with thrown ball (non-pitch)            | 6.1%         | <b>11.9%</b> | 1.96 (1.00, 3.83)         |
| Throwing - not pitching                         | <b>5.5%</b>  | 5.1%         | 1.08 (0.48, 2.45)         |
| Rotation around a planted foot/inversion        | 3.9%         | <b>7.2%</b>  | 1.87 (0.79, 4.41)         |
| Other                                           | <b>20.4%</b> | 19.1%        | 1.07 (0.72, 1.58)         |
| <b>Total</b>                                    | <b>100%</b>  | <b>100%</b>  | ---                       |

†Totals do not always equal 100% due to slight rounding.

**Table 23.45 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Baseball     | Softball     | IPR (95% CI)             |
|-----------------------------------|--------------|--------------|--------------------------|
| <b>Baseball/Softball Activity</b> |              |              |                          |
| Pitching                          | <b>17.8%</b> | 6.0%         | <b>2.98 (1.64, 5.42)</b> |
| Fielding a batted ball            | 17.2%        | <b>27.7%</b> | <b>1.61 (1.10, 2.35)</b> |
| Running bases                     | <b>16.7%</b> | 11.5%        | 1.45 (0.90, 2.35)        |
| Batting                           | <b>13.9%</b> | 6.8%         | <b>2.04 (1.12, 3.71)</b> |
| Throwing (not pitching)           | <b>9.4%</b>  | 7.2%         | 1.31 (0.69, 2.49)        |
| Fielding a thrown ball            | 6.1%         | <b>6.4%</b>  | 1.04 (0.49, 2.22)        |
| General play                      | <b>5.6%</b>  | 4.3%         | 1.31 (0.56, 3.07)        |
| Sliding                           | 3.9%         | <b>12.8%</b> | <b>3.28 (1.48, 7.30)</b> |
| Catching                          | 3.3%         | <b>8.5%</b>  | <b>2.55 (1.05, 6.23)</b> |
| Conditioning                      | 2.2%         | <b>3.4%</b>  | 1.53 (0.47, 5.01)        |
| Other                             | 3.9%         | <b>5.5%</b>  | 1.42 (0.58, 3.49)        |
| <b>Total</b>                      | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

### 23.5 Boys' and Girls' Swimming

**Table 23.5 Comparison of Boys' and Girls' Swimming Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|             | Boys' swimming | Girls' swimming | RR (95% CI)              |
|-------------|----------------|-----------------|--------------------------|
| Total       | 0.19           | <b>0.38</b>     | <b>2.02 (1.04, 4.12)</b> |
| Competition | 0.08           | <b>0.14</b>     | 1.77 (0.16, 19.49)       |
| Practice    | 0.21           | <b>0.43</b>     | <b>2.04 (1.01, 4.12)</b> |

**Table 23.50 Comparison of Body Sites of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' swimming | Girls' swimming | IPR (95% CI)      |
|------------------|----------------|-----------------|-------------------|
| <b>Body Site</b> |                |                 |                   |
| Shoulder         | <b>66.7%</b>   | 39.3%           | 1.70 (0.92, 3.12) |
| Head/face        | <b>16.7%</b>   | 10.7%           | 1.56 (0.30, 8.15) |
| Lower leg        | <b>16.7%</b>   | 0.0%            | ---               |
| Knee             | 0.0%           | <b>17.9%</b>    | ---               |
| Trunk            | 0.0%           | <b>17.9%</b>    | ---               |
| Ankle            | 0.0%           | <b>10.7%</b>    | ---               |
| Arm/elbow        | 0.0%           | <b>3.6%</b>     | ---               |
| <b>Total</b>     | <b>100%</b>    | <b>100%</b>     | ---               |

†Totals do not always equal 100% due to slight rounding.

**Table 23.51 Comparison of Diagnoses of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' swimming | Girls' swimming | IPR (95% CI)       |
|------------------|----------------|-----------------|--------------------|
| <b>Diagnosis</b> |                |                 |                    |
| Concussion       | <b>16.7%</b>   | 10.7%           | 1.56 (0.30, 8.15)  |
| Strain/sprain    | 8.3%           | <b>35.7%</b>    | 4.29 (0.62, 29.86) |
| Contusion        | 0.0%           | <b>3.6%</b>     | ---                |
| Fracture         | 0.0%           | 0.0%            | ---                |
| Other            | <b>75.0%</b>   | 50.0%           | 1.50 (0.92, 2.46)  |
| <b>Total</b>     | <b>100%</b>    | <b>100%</b>     | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.52 Most Common Boys' and Girls' Swimming Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                        | Boys' swimming | Girls' swimming | IPR (95% CI)             |
|------------------------|----------------|-----------------|--------------------------|
| <b>Diagnosis</b>       |                |                 |                          |
| Shoulder other         | <b>66.7%</b>   | 21.4%           | <b>3.11 (1.38, 7.02)</b> |
| Lower leg other        | <b>8.3%</b>    | 0.0%            | ---                      |
| Shoulder strain/sprain | 0.0%           | <b>17.9%</b>    | ---                      |
| Trunk other            | 0.0%           | <b>7.1%</b>     | ---                      |
| Trunk strain/sprain    | <b>0.0%</b>    | <b>7.1%</b>     | ---                      |

\*Only includes diagnoses accounting for >5% of baseball or softball injuries.

**Table 23.53 Comparison of Time Loss of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' swimming | Girls' swimming | IPR (95% CI)       |
|------------------|----------------|-----------------|--------------------|
| <b>Time Loss</b> |                |                 |                    |
| 1-2 days         | <b>16.7%</b>   | 14.3%           | 1.17 (0.25, 5.53)  |
| 3-6 days         | 16.7%          | <b>32.1%</b>    | 1.93 (0.49, 7.63)  |
| 7-9 days         | <b>25.0%</b>   | 3.6%            | 7.00 (0.81, 60.68) |
| 10-21 days       | 25.0%          | <b>28.6%</b>    | 1.14 (0.37, 3.58)  |
| 22 days or more  | 0.0%           | <b>10.7%</b>    | ---                |
| Other            | <b>16.7%</b>   | 10.7%           | 1.56 (0.30, 8.15)  |
| <b>Total</b>     | <b>100%</b>    | <b>100%</b>     | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.54 Comparison of Mechanisms of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                 | Boys' swimming | Girls' swimming | IPR (95% CI)       |
|-------------------------------------------------|----------------|-----------------|--------------------|
| <b>Swimming Mechanism</b>                       |                |                 |                    |
| N/A (overuse, heat illness, conditioning, etc.) | 58.3%          | <b>75.0%</b>    | 1.29 (0.76, 2.17)  |
| Contact with wall                               | <b>25.0%</b>   | 3.6%            | 7.00 (0.81, 60.68) |
| Contact with another person                     | <b>8.3%</b>    | 3.6%            | 2.33 (0.16, 34.31) |
| Other                                           | 8.3%           | <b>17.9%</b>    | 2.14 (0.28, 16.44) |
| <b>Total</b>                                    | <b>100%</b>    | <b>100%</b>     | ---                |

†Totals do not always equal 100% due to slight rounding.

**Table 23.55 Comparison of Activities of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                             | Boys' swimming | Girls' swimming | IPR (95% CI)       |
|---------------------------------------------|----------------|-----------------|--------------------|
| <b>Swimming Activity</b>                    |                |                 |                    |
| Swimming                                    | <b>75.0%</b>   | 64.3%           | 1.17 (0.76, 1.79)  |
| Flip turn off wall                          | <b>8.3%</b>    | 3.6%            | 2.33 (0.16, 34.31) |
| Diving off board/platform/starting platform | 0.0%           | <b>17.9%</b>    | ---                |
| Other                                       | <b>16.7%</b>   | 14.3%           | 1.17 (0.25, 5.53)  |
| <b>Total</b>                                | <b>100%</b>    | <b>100%</b>     | ---                |

†Totals do not always equal 100% due to slight rounding.

### 23.6 Boys' and Girls' Track and Field

**Table 23.6 Comparison of Boys' and Girls' Track and Field Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|              | Boys' track | Girls' track | RR (95% CI)              |
|--------------|-------------|--------------|--------------------------|
| <b>Total</b> | 0.74        | <b>0.93</b>  | <b>1.25 (1.01, 1.54)</b> |
| Competition  | <b>1.16</b> | 1.07         | 1.08 (0.72, 1.62)        |
| Practice     | 0.64        | <b>0.89</b>  | <b>1.39 (1.09, 1.79)</b> |

**Table 23.60 Comparison of Body Sites of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                     | Boys' track  | Girls' track | IPR (95% CI)             |
|---------------------|--------------|--------------|--------------------------|
| <b>Body Site</b>    |              |              |                          |
| Hip/thigh/upper leg | <b>49.1%</b> | 34.6%        | <b>1.42 (1.10, 1.83)</b> |
| Lower leg           | 15.2%        | <b>23.5%</b> | 1.55 (0.99, 2.42)        |
| Ankle               | <b>11.5%</b> | 11.2%        | 1.03 (0.57, 1.86)        |
| Knee                | 6.7%         | <b>12.3%</b> | 1.84 (0.92, 3.68)        |
| Trunk               | <b>5.5%</b>  | 3.9%         | 1.40 (0.53, 3.66)        |
| Foot                | 4.8%         | <b>8.4%</b>  | 1.73 (0.75, 3.97)        |
| Shoulder            | <b>2.4%</b>  | 1.7%         | 1.45 (0.33, 6.37)        |
| Head/face           | <b>1.8%</b>  | 1.7%         | 1.09 (0.22, 5.30)        |
| Arm/elbow           | <b>1.2%</b>  | 0.6%         | 2.17 (0.20, 23.71)       |
| Hand/wrist          | 0.0%         | <b>1.7%</b>  | ---                      |
| Neck                | 0.0%         | <b>0.6%</b>  | ---                      |
| Other               | <b>1.8%</b>  | 0.0%         | ---                      |
| <b>Total</b>        | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.61 Comparison of Diagnoses of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' track  | Girls' track | IPR (95% CI)             |
|------------------|--------------|--------------|--------------------------|
| <b>Diagnosis</b> |              |              |                          |
| Strain/sprain    | <b>67.3%</b> | 51.1%        | <b>1.32 (1.10, 1.57)</b> |
| Contusion        | 2.4%         | <b>4.5%</b>  | 1.85 (0.57, 6.04)        |
| Fracture         | 1.2%         | <b>3.4%</b>  | 2.78 (0.57, 13.59)       |
| Concussion       | 1.2%         | <b>1.7%</b>  | 1.39 (0.24, 8.22)        |
| Other            | 27.9%        | <b>39.3%</b> | <b>1.41 (1.04, 1.92)</b> |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.62 Most Common Boys' and Girls' Track and Field Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                   | Boys' track  | Girls' track | IPR (95% CI)             |
|-----------------------------------|--------------|--------------|--------------------------|
| <b>Diagnosis</b>                  |              |              |                          |
| Hip/thigh/upper leg strain/sprain | <b>43.0%</b> | 29.6%        | <b>1.45 (1.09, 1.94)</b> |
| Lower leg other                   | 11.5%        | <b>19.0%</b> | 1.65 (0.98, 2.78)        |
| Hip/thigh/upper leg other         | <b>5.5%</b>  | 4.5%         | 1.22 (0.48, 3.09)        |
| Trunk strain/sprain               | <b>3.6%</b>  | 1.7%         | 2.17 (0.55, 8.54)        |
| Shoulder strain/sprain            | <b>1.8%</b>  | 1.7%         | 1.09 (0.22, 5.30)        |

\*Only includes diagnoses accounting for >5% of baseball or softball injuries.

**Table 23.63 Comparison of Time Loss of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                  | Boys' track  | Girls' track | IPR (95% CI)             |
|------------------|--------------|--------------|--------------------------|
| <b>Time Loss</b> |              |              |                          |
| 1-2 days         | 13.9%        | <b>14.0%</b> | 1.00 (0.59, 1.85)        |
| 3-6 days         | 24.8%        | <b>34.1%</b> | 1.37 (0.98, 1.92)        |
| 7-9 days         | <b>18.8%</b> | 17.9%        | 1.05 (0.67, 1.64)        |
| 10-21 days       | <b>21.8%</b> | 17.9%        | 1.22 (0.80, 1.87)        |
| 22 days or more  | <b>7.3%</b>  | 2.2%         | <b>3.26 (1.07, 9.89)</b> |
| Other            | 13.3%        | <b>14.0%</b> | 1.05 (0.62, 1.78)        |
| <b>Total</b>     | <b>100%</b>  | <b>100%</b>  | ---                      |

†Totals do not always equal 100% due to slight rounding.

**Table 23.64 Comparison of Mechanisms of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                                       | Boys' track  | Girls' track | IPR (95% CI)      |
|-------------------------------------------------------|--------------|--------------|-------------------|
| <b>Track Mechanism</b>                                |              |              |                   |
| N/A (e.g., overuse, heat illness, conditioning, etc.) | 54.0%        | <b>60.3%</b> | 1.12 (0.93, 1.35) |
| Contact with ground/track/surface                     | <b>17.8%</b> | 14.5%        | 1.23 (0.75, 1.99) |
| Fall/trip                                             | <b>6.7%</b>  | 3.4%         | 2.01 (0.76, 5.32) |
| Rotation around planted foot/inversion                | 5.5%         | <b>7.3%</b>  | 1.32 (0.58, 3.00) |
| Contact with field equipment                          | 3.1%         | <b>3.4%</b>  | 1.09 (0.34, 3.51) |
| Uneven playing surface                                | <b>1.8%</b>  | 1.1%         | 1.65 (0.28, 9.73) |
| Stepped on/kicked                                     | <b>0.6%</b>  | 0.0%         | ---               |
| Contact with another person                           | 0.0%         | <b>2.2%</b>  | ---               |
| Other                                                 | <b>10.4%</b> | 7.8%         | 1.33 (0.68, 2.62) |
| <b>Total</b>                                          | <b>100%</b>  | <b>100%</b>  | ---               |

†Totals do not always equal 100% due to slight rounding.

**Table 23.65 Comparison of Activities of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2011-12 School Year**

|                                       | Boys' track  | Girls' track | IPR (95% CI)       |
|---------------------------------------|--------------|--------------|--------------------|
| <b>Track Activity</b>                 |              |              |                    |
| Running                               | <b>66.5%</b> | 61.5%        | 1.08 (0.92, 1.27)  |
| Jumping/landing                       | 12.8%        | <b>17.3%</b> | 1.35 (0.81, 2.26)  |
| Conditioning                          | <b>6.1%</b>  | 4.5%         | 1.36 (0.55, 3.37)  |
| Throwing                              | 4.3%         | <b>4.5%</b>  | 1.05 (0.39, 2.82)  |
| Running hurdles                       | 3.0%         | <b>5.0%</b>  | 1.65 (0.56, 4.82)  |
| Warming up                            | 1.8%         | <b>3.9%</b>  | 2.14 (0.56, 8.13)  |
| Leaving block                         | <b>1.2%</b>  | 1.1%         | 1.09 (0.16, 7.66)  |
| Hit by shot put/discus/javelin/hammer | 0.6%         | <b>1.1%</b>  | 1.83 (0.17, 20.02) |
| Other                                 | <b>3.7%</b>  | 1.1%         | 3.27 (0.67, 16.00) |
| <b>Total</b>                          | <b>100%</b>  | <b>100%</b>  | ---                |

†Totals do not always equal 100% due to slight rounding.

## **XXIV. Reporter Demographics & Compliance**

During the 2011-12 school year, 208 ATs were invited to participate in the study at the beginning of the school year. ATs were expected to report for every week in which they were enrolled. For example, an AT who joined the study as a replacement school in week 10 was not expected to report for weeks 1-9. Overall, 174 enrolled ATs reported an average of 37 study weeks. The majority of ATs (77.2%) reported all the weeks during which they were enrolled, with only 16.9% of ATs missing over 10 weeks. Because internal validity checks conducted during the first six years of the study consistently found high sensitivity, specificity, positive predictive values, and negative predictive values, internal validity checks will be conducted every other year. Internal validity checks during the 2010-11 academic year yielded 96.3% sensitivity, 100.0% specificity, a positive predictive value of 100.0%, and a negative predictive value of 99.5%.

Prior to the start of the 2011-12 High School RIO™ study, participating ATs were asked to complete a short demographics survey. Three-quarters (80.2%) of participating high schools were public schools, with the remainder being private. All ATs except one provided services to athletes of their high school on 5 or more days each week. Over 80% (81.3%) of ATs participating during the 2011-12 study year had previously participated in the High School RIO™ study.

An online “End of Season” survey gave all participating ATs (both in the original study as well as in the expanded study (n=183 combined) the opportunity to provide feedback on their experiences with High School RIO™. This survey was completed by 132 ATs (72.1%). Average reporting time burdens were 19 minutes for the weekly exposure report and 9 minutes for the injury report form. Using a 5 point Likert scale, RIO™ was overwhelmingly reported to be either very easy (49.2%) or somewhat easy (42.4%) to use (5 and 4 on the Likert scale,

respectively), with ATs being either very satisfied (58.3%) or somewhat satisfied (33.3%) with the study (5 and 4 on the Likert scale, respectively). Suggestions provided by ATs, such as the addition or clarification of questions or answer choices, will be used to improve the National High School Sports-Related Injury Surveillance Study for the 2012-13 school year.

## **XXV. Summary**

High school sports play an important role in the adoption and maintenance of a physically active lifestyle among millions of US adolescents. Too often injury prevention in this population is overlooked as sports-related injuries are thought to be unavoidable. In reality, sports-related injuries are largely preventable through the application of evidence-based preventive interventions. Such preventive interventions can include educational campaigns, introduction of new/improved protective equipment, rule changes, other policy changes, etc. The morbidity, mortality, and disability caused by high school sports-related injuries can be reduced through the development and implementation of improved injury diagnosis and treatment modalities as well as through effective prevention strategies. However, surveillance of exposure based injury rates in a large nationally disperse sample of high school athletes and subsequent epidemiologic analysis of patterns of injury are needed to drive evidence-based prevention practices.

Prior to the implementation of the High School Sports-Related Injury Surveillance Study by Dr. Comstock, the study of high school sports-related injuries had largely been limited by an inability to calculate injury rates due to a lack of exposure data (i.e., frequency of participation in athletic activities including training, practice, and competition), an inability to compare findings across groups (i.e., sports/activities, genders, schools, and levels of competition), or an inability to generalize findings from small non-representative samples. The value of national injury surveillance studies that collect injury, exposure, and risk factor data from representative samples has been well demonstrated by the National Collegiate Athletic Association's Injury Surveillance System (NCAA ISS). Data collected by the NCAA ISS since 1982 has been used to develop preventive interventions including changes in coaching habits, increased use of protective equipment, and rule changes which have had proven success in reducing injuries among collegiate athletes. For example, NCAA ISS data has been used to develop several interventions

intended to reduce the number of preseason heat-related football injuries including the elimination of consecutive days of multiple practices, daily hour limitations, and a gradual increase in equipment for conditioning and heat acclimation. Additionally, several committees have considered NCAA ISS data when making recommendations including the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports' recommendation for mandatory eye protection in women's lacrosse, the NCAA Men's Ice Hockey Rules Committee's recommendation for stricter penalties for hitting from behind, checking into the boards, and not wearing a mouthpiece, and the NCAA Men's Basketball Rules Committee's recent discussions of widening the free-throw lane to prevent injuries related to player contact. Unfortunately, because an equivalent injury surveillance system to collect injury and exposure data from a nationally representative sample of high school athletes had not previously existed, injury prevention efforts targeted to reduce injury rates in this population were based largely upon data collected from collegiate athletes. This is unacceptable because distinct biophysiological differences (e.g., lower muscle mass, immature growth plates, etc.) means high school athletes are not merely miniature versions of their collegiate counterparts.

The successful implementation and maintenance of the National High School Sports-Related Injury Surveillance Study demonstrates the value of a national injury surveillance system at the high school level. Dr. Comstock and her research staff are committed to maintaining a permanent national high school sports injury surveillance system.

While the health benefits of a physically active lifestyle including sports participation are undeniable, participants are at risk of injury because a certain endemic level of injury can be expected during any physical activity, especially those with a competitive component. However, injury rates among high school athletes should be reduced to the lowest possible level without

discouraging adolescents from engaging in this important form of physical activity. This goal can best be accomplished by monitoring injury rates and patterns of injury among high school athletes over time; investigating the etiology of preventable injuries; and developing, implementing, and evaluating evidence-based preventive interventions. Surveillance systems such as the model used for this study are critical in achieving these goals.