# Original Sample Summary Report

# NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

## 2023-24 School Year

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High School RIO™

High School Sports-Related Injury Surveillance Study

## ACKNOWLEDGEMENTS

We thank the certified athletic trainers (ATs) for their hard work and dedication in providing us with complete and accurate data. Without their efforts, this study would not have been possible. We would like to thank the National Federation of State High School Associations (NFHS) for their support of this project. The content of this report was funded in part by the Centers for Disease Control and Prevention (CDC) grants #R49/CE000674-01 and #R49/CE001172-01. The content of this report is solely the responsibility of the authors and does not necessarily represent the official views of the CDC. We would also like to acknowledge the generous research funding contributions of the National Federation of State High School Associations (NFHS), National Operating Committee on Standards for Athletic Equipment (NOCSAE), and DonJoy Orthotics.


## 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, Christy Collins, PhD, is happy to provide further information or to discuss research partnership opportunities upon request. Data contained within these reports should not be published without permission from the Principal Investigator.

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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 over 8.0 million in the 2023-24 school year. 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 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 2005-06 school year, the National High School Sports-Related Injury Surveillance Study has monitored injuries among US high school athletes participating in boys' football, boys' and girls' soccer, girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, and girls' softball. Other sports were added in subsequent years including girls' field hockey, girls' gymnastics, boys' volleyball, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field, boys' and girls' tennis, boys' and girls' cross country, and cheerleading (boys' volleyball, girls' gymnastics, and boys' and girls' tennis are no longer under surveillance). The study data have been collected using the time- and cost-efficient RIO (Reporting Information Online) surveillance system. Through the generous contributions of the National Federation of State High School Associations (NFHS) and the NFHS Foundation, the National High School Sports-Related Injury Surveillance Study was able to be continued during the 2023-24 school year. Previous years of this study were funded by the Centers for Disease Control and Prevention (CDC), National Federation of State High School Associations (NFHS), the National Operating Committee on Standards for Athletic Equipment (NOCSAE), the Research Institute at Nationwide Children's Hospital, DonJoy Orthotics, EyeBlack, and The Ohio State University.

During the 2019-20 school year, the National High School Sports-Related Injury Surveillance Study transitioned from Dr. Dawn Comstock at the University of Colorado to Dr. Christy Collins at the Datalys Center for Sports Injury Research and Prevention, Inc. Dr. Collins worked with Dr. Comstock on the National High School Sports-Related Injury Surveillance Study during the 2005-06 through 2013-14 school years and is carrying on the important work of this surveillance system.

### 1.3 Specific Aims

The continuing objectives of this study are to maintain the National High School Sports- Related Injury Surveillance Study 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, girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, and girls' softball 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 9 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.
F. To compare injury rates and patterns from the 2005-06 through the 2023-24 school years.

### 1.4 Project Design

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

A. An injury that occurred as a result of participation in an organized high school competition or practice 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 OR
D. Any fracture, concussion, dental injury, or exertional heat event 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 or competition where he or she is exposed to the possibility of athletic injury. Exposure was expressed in two 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.

### 1.5 Sample Recruitment

Certified athletic trainers (AT) who provide care to high school athletes were eligible to participate. Eligible ATs received an email introducing the study and inviting them to participate. All high schools with an AT willing to serve as a reporter were categorized into 8 sampling strata by geographic location (northeast, midwest, south, and west) and high school size (enrollment <= 1,000 or > 1,000 students). Participant schools were then randomly selected from each substrata to obtain 100 study schools. To maintain a nationally representative sample, if a school dropped out of the study, another school from the same stratum was randomly selected for replacement. Participating ATs were offered a $300-$350 honorarium depending on the number of sports reported along with an individualized school injury report and 10 Category B CEUs following the study's conclusion.

### 1.6 Data Collection

ATs enrolled in the National High School Sports-Related Injury Surveillance Study received an email every Monday throughout the study period reminding them to enter their school's data into the RIO surveillance system. Each participating AT was asked to complete 48 weekly exposure reports: one for each week from July 24, 2023 through June 23, 2024. Exposure reports collected exposure information (number of athlete-competitions, athlete-practices, and athlete-performances for cheerleading) and the number of reportable injuries sustained by student athletes for each sport 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.). The 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 9.4. Although fractures, concussions, dental injuries, and exertional heat events resulting in <1 day time loss were collected, unless otherwise noted, analyses in this report excluded these injuries. With the exception of injury rates, data were weighted for all analyses to produce national estimates. For each sport in each stratum, weights account for the total number of US schools offering the sport and the average number of participating study schools reporting each week for that sport. For example, following is the algorithm used to calculate football weights for the small (enrollment <= 1,000) west stratum:

$$\text{weight} = \frac{\text{national total \# of small west US high schools}}{\text{average \# of small west participating schools reporting football each week}}$$

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 (CIs). The following is an example of the RR calculation comparing the rate of injury in boys' soccer to the rate of injury in girls' soccer:

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

Injury proportions were compared using injury proportion ratios (IPR) and corresponding 95% CIs adjusted to account for the sampling weights and the complex sampling design. The following is an example of the IPR calculation comparing the proportion of boys' soccer concussions to the proportion of girls' soccer concussions:

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

An RR or IPR >1.00 suggests a risk association while an RR or IPR <1.00 suggests a protective association. CIs not including 1.00 were considered statistically significant. Injury rates over time were compared by running a linear regression and testing for trend.

# II. Overall Injury Epidemiology

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**Table 2.1 Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Event Type | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|---|
| ***Overall*** | ***Total*** | ***3,416*** | ***1,521,358*** | ***2.25*** | ***1,499,393*** |
| | Competition | 2,008 | 426,323 | 4.71 | 871,776 |
| | Practice | 1,408 | 1,095,035 | 1.29 | 627,617 |
| ***Boys' Football*** | ***Total*** | ***1,376*** | ***384,982*** | ***3.57*** | ***562,530*** |
| | Competition | 840 | 66,615 | 12.61 | 332,956 |
| | Practice | 536 | 318,367 | 1.68 | 229,574 |
| ***Boys' Soccer*** | ***Total*** | ***312*** | ***165,311*** | ***1.89*** | ***192,806*** |
| | Competition | 196 | 49,236 | 3.98 | 118,247 |
| | Practice | 116 | 116,075 | 1.00 | 74,559 |
| ***Girls' Soccer*** | ***Total*** | ***381*** | ***141,477*** | ***2.69*** | ***205,801*** |
| | Competition | 250 | 42,848 | 5.83 | 130,307 |
| | Practice | 131 | 98,629 | 1.33 | 75,494 |
| ***Girls' Volleyball*** | ***Total*** | ***140*** | ***136,754*** | ***1.02*** | ***60,718*** |
| | Competition | 54 | 48,821 | 1.11 | 23,122 |
| | Practice | 86 | 87,933 | 0.98 | 37,596 |
| ***Boys' Basketball*** | ***Total*** | ***281*** | ***177,261*** | ***1.59*** | ***102,434*** |
| | Competition | 147 | 56,508 | 2.60 | 54,994 |
| | Practice | 134 | 120,753 | 1.11 | 47,440 |
| ***Girls' Basketball*** | ***Total*** | ***272*** | ***115,351*** | ***2.36*** | ***96,585*** |
| | Competition | 191 | 37,157 | 5.14 | 68,747 |
| | Practice | 81 | 78,194 | 1.04 | 27,838 |
| ***Boys' Wrestling*** | ***Total*** | ***374*** | ***150,832*** | ***2.48*** | ***128,822*** |
| | Competition | 167 | 39,231 | 4.26 | 62,263 |
| | Practice | 207 | 111,601 | 1.85 | 66,559 |

| | | | | | |
|---|---|---|---|---|---|
| ***Boys' Baseball*** | ***Total*** | ***160*** | ***151,183*** | ***1.06*** | ***74,776*** |
| | Competition | 96 | 52,038 | 1.84 | 43,526 |
| | Practice | 64 | 99,145 | 0.65 | 31,250 |
| ***Girls' Softball*** | ***Total*** | ***120*** | ***98,207*** | ***1.22*** | ***74,921*** |
| | Competition | 67 | 33,869 | 1.98 | 37,614 |
| | Practice | 53 | 64,338 | 0.82 | 37,307 |

* Only includes injuries resulting in ≥1 day time loss.

**Table 2.2 Proportion of Injuries Resulting in Time Loss, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | < 1 Day Time Loss | ≥ 1 Day Time Loss | Time Loss Data Missing | Total |
|---|---|---|---|---|
| | % | % | % | % |
| ***Overall*** | ***3.3%*** | ***93.1%*** | ***3.7%*** | ***100.0%*** |
| Boys' Football | 3.6% | 92.7% | 3.8% | 100.0% |
| Boys' Soccer | 2.2% | 96.9% | 0.9% | 100.0% |
| Girls' Soccer | 3.2% | 92.9% | 3.9% | 100.0% |
| Girls' Volleyball | 7.0% | 89.2% | 3.8% | 100.0% |
| Boys' Basketball | 3.9% | 91.8% | 4.2% | 100.0% |
| Girls' Basketball | 2.7% | 91.6% | 5.7% | 100.0% |
| Boys' Wrestling | 1.3% | 95.7% | 3.1% | 100.0% |
| Boys' Baseball | 2.4% | 94.7% | 3.0% | 100.0% |
| Girls' Softball | 5.3% | 90.2% | 4.5% | 100.0% |

* By study definition, non-time loss injuries were fractures, concussions, dental injuries, and exertional heat events that resulted in < 1 day time loss. Because they accounted for a small proportion of all injuries overall, 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, 2023-24 School Year ***

| | Male | | Female | |
|---|---|---|---|---|
| **Year in School** | **n** | **%** | **n** | **%** |
| Freshman | 203,575 | 20.7% | 107,799 | 26.0% |
| Sophomore | 275,052 | 28.0% | 117,840 | 28.4% |
| Junior | 250,926 | 25.5% | 112,307 | 27.1% |
| Senior | 254,323 | 25.8% | 77,129 | 18.6% |
| ***Total ***** | ***983,877*** | ***100.0%*** | ***415,075*** | ***100.0%*** |

| **Age (years)** | | |
|---|---|---|
| Minimum | 13 | 13 |
| Maximum | 19 | 18 |
| Mean (SD) | 15.8 (1.2) | 15.6 (1.2) |
| n | 844,922 | 353,583 |

| **BMI** | | |
|---|---|---|
| Minimum | 16.4 | 15.2 |
| Maximum | 53.0 | 42.5 |
| Mean (SD) | 25.0 (4.8) | 22.5 (3.6) |
| n | 600,394 | 251,312 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.
** Throughout this chapter, totals and n's represent the total 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, 2023-24 School Year**

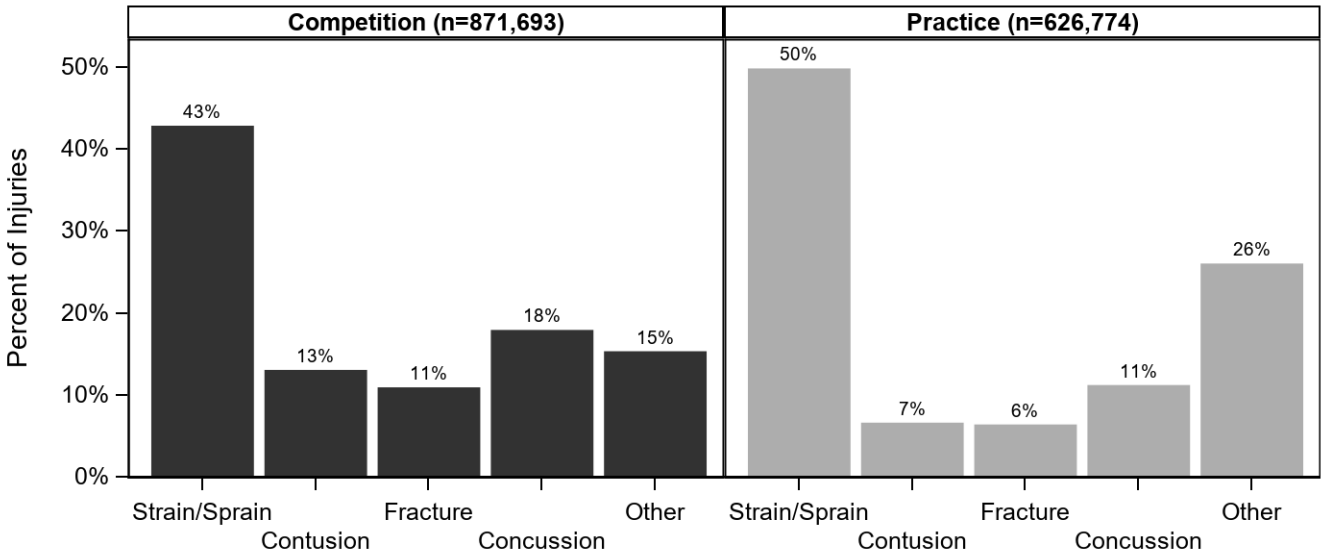



**Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle | 166,389 | 19.1% | 110,089 | 17.5% | 276,478 | 18.4% |
| Head/Face | 179,563 | 20.6% | 81,784 | 13.0% | 261,347 | 17.4% |
| Knee | 142,652 | 16.4% | 87,398 | 13.9% | 230,050 | 15.3% |
| Hip/Thigh/Upper Leg | 69,914 | 8.0% | 85,478 | 13.6% | 155,392 | 10.4% |
| Hand/Wrist | 77,149 | 8.8% | 51,253 | 8.2% | 128,402 | 8.6% |
| Shoulder | 57,890 | 6.6% | 45,950 | 7.3% | 103,840 | 6.9% |
| Lower Leg | 39,379 | 4.5% | 41,526 | 6.6% | 80,905 | 5.4% |
| Trunk | 35,937 | 4.1% | 42,146 | 6.7% | 78,082 | 5.2% |
| Foot | 34,423 | 3.9% | 34,759 | 5.5% | 69,182 | 4.6% |
| Arm/Elbow | 32,623 | 3.7% | 21,331 | 3.4% | 53,954 | 3.6% |
| Other | 21,451 | 2.5% | 8,484 | 1.4% | 29,935 | 2.0% |
| Neck | 10,023 | 1.1% | 5,891 | 0.9% | 15,914 | 1.1% |
| Systemic | 4,381 | 0.5% | 11,532 | 1.8% | 15,913 | 1.1% |
| ***Total*** | ***871,776*** | ***100.0%*** | ***627,618*** | ***100.0%*** | ***1,499,394*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Male (n=158,726) | | Female (n=102,717) | | Overall (n=261,443) | |
|---|---|---|---|---|---|---|
| **Ankle Ligament Injuries** | **n** | **%** | **n** | **%** | **n** | **%** |
| Anterior Talofibular Ligament | 110,352 | 69.5% | 77,953 | 75.9% | 188,305 | 72.0% |
| Calcaneofibular Ligament | 47,106 | 29.7% | 30,951 | 30.1% | 78,057 | 29.9% |
| Anterior Tibiofibular Ligament | 26,132 | 16.5% | 13,104 | 12.8% | 39,236 | 15.0% |
| Posterior Talofibular Ligament | 13,645 | 8.6% | 11,128 | 10.8% | 24,773 | 9.5% |
| Deltoid Ligament | 12,942 | 8.2% | 6,407 | 6.2% | 19,349 | 7.4% |
| Posterior Tibiofibular Ligament | 3,185 | 2.0% | 1,552 | 1.5% | 4,737 | 1.8% |

* Multiple ligament responses allowed per injury report. Totals and n's are not always equal due to slight rounding of the weighted number of injuries and missing responses. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Male (n=153,433) | | Female (n=69,035) | | Overall (n=222,468) | |
|---|---|---|---|---|---|---|
| **Knee Ligament Injuries** | **n** | **%** | **n** | **%** | **n** | **%** |
| Patella and/or Patellar Tendon | 44,560 | 29.0% | 15,876 | 23.0% | 60,436 | 27.2% |
| Medial Collateral Ligament | 39,724 | 25.9% | 10,868 | 15.7% | 50,592 | 22.7% |
| Anterior Cruciate Ligament | 25,366 | 16.5% | 14,162 | 20.5% | 39,528 | 17.8% |
| Torn Cartilage (Meniscus) | 22,068 | 14.4% | 13,839 | 20.0% | 35,907 | 16.1% |
| Lateral Collateral Ligament | 4,905 | 3.2% | 5,494 | 8.0% | 10,399 | 4.7% |
| Posterior Cruciate Ligament | 2,144 | 1.4% | 1,770 | 2.6% | 3,914 | 1.8% |

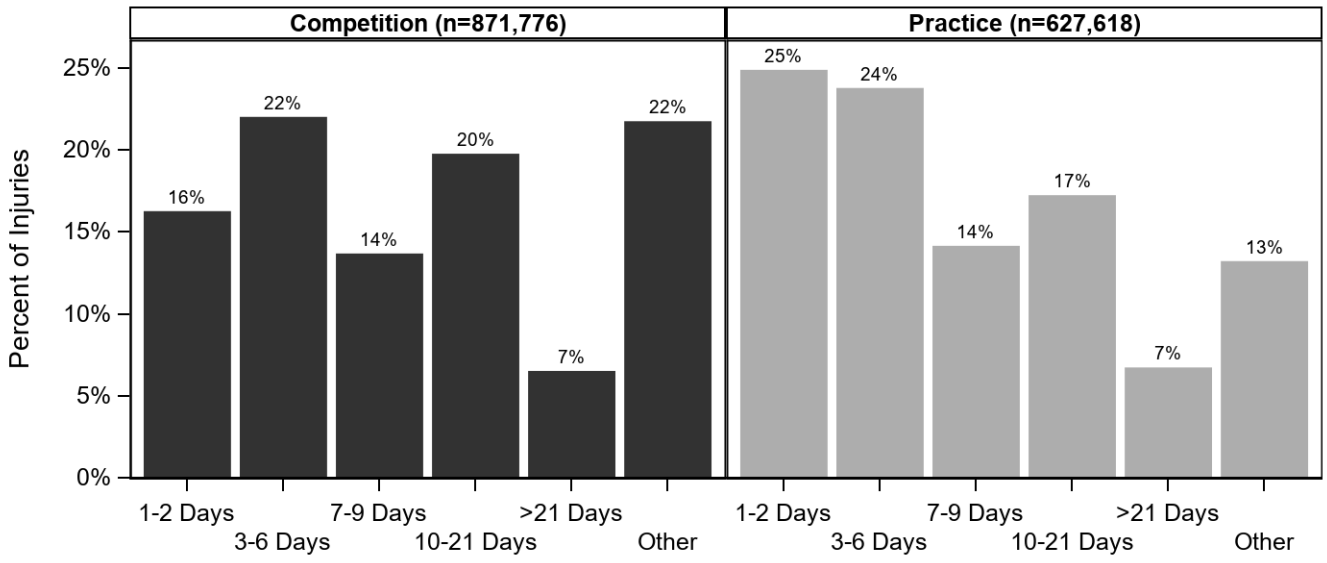
* Multiple ligament responses allowed per injury report. Totals and n's are not always equal due to slight rounding of the weighted number of injuries and missing responses. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=871,693) | | Practice (n=626,773) | | Overall (n=1,498,469) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle Strain/Sprain | 144,183 | 16.5% | 99,360 | 15.9% | 243,543 | 16.3% |
| Head/Face Concussion | 156,131 | 17.9% | 70,118 | 11.2% | 226,249 | 15.1% |
| Hip/Thigh/Upper Leg Strain/Sprain | 44,310 | 5.1% | 75,882 | 12.1% | 120,193 | 8.0% |
| Knee Strain/Sprain | 77,797 | 8.9% | 27,067 | 4.3% | 104,864 | 7.0% |
| Knee Other | 39,311 | 4.5% | 51,623 | 8.2% | 90,933 | 6.1% |
| Shoulder Other | 31,296 | 3.6% | 20,743 | 3.3% | 52,039 | 3.5% |
| Hand/Wrist Fracture | 32,835 | 3.8% | 18,579 | 3.0% | 51,414 | 3.4% |
| Hand/Wrist Strain/Sprain | 26,535 | 3.0% | 19,980 | 3.2% | 46,514 | 3.1% |
| Shoulder Strain/Sprain | 22,054 | 2.5% | 22,716 | 3.6% | 44,769 | 3.0% |
| Trunk Strain/Sprain | 13,790 | 1.6% | 24,904 | 4.0% | 38,694 | 2.6% |

* Totals and n's represent the total 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 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 72,396 | 8.4% | 25,252 | 4.1% | 97,648 | 6.6% |
| Did Not Require Surgery | 789,290 | 91.6% | 594,985 | 95.9% | 1,384,275 | 93.4% |
| ***Total*** | ***861,686*** | ***100.0%*** | ***620,237*** | ***100.0%*** | ***1,481,923*** | ***100.0%*** |

* Totals and n's represent the total 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 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

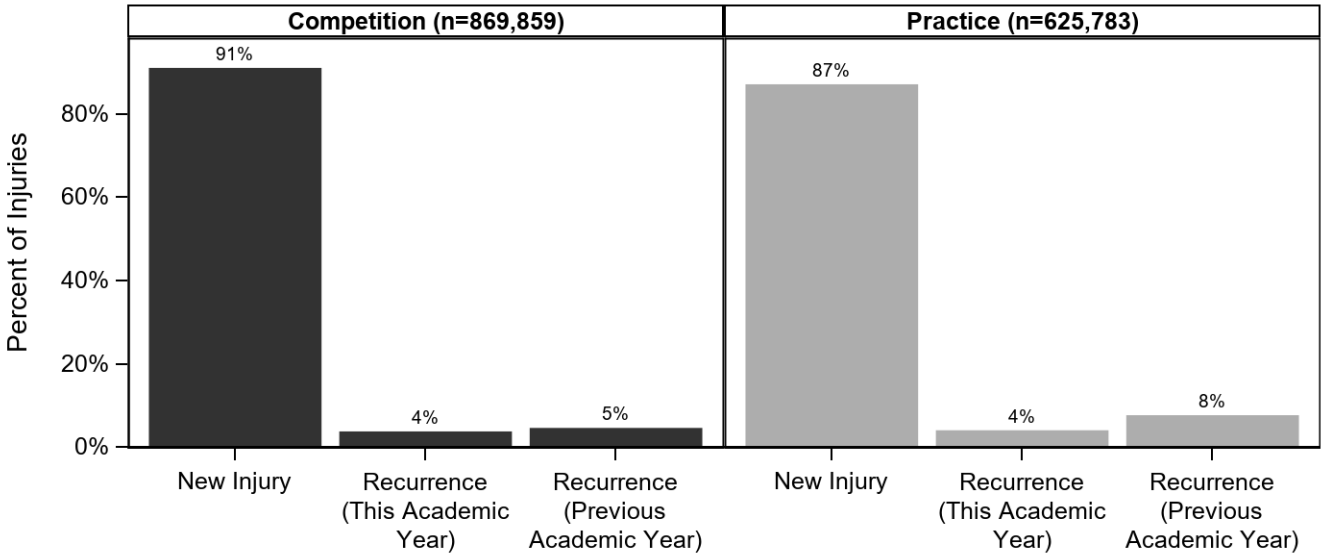


**Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 291,563 | 19.5% |
| Regular Season | 1,115,517 | 74.5% |
| Post Season | 75,306 | 5.0% |
| Unknown/Other | 15,121 | 1.0% |
| ***Total*** | ***1,497,506*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 50,076 | 8.1% |
| Second 1/2 Hour | 82,155 | 13.2% |
| 1-2 Hours into Practice | 303,498 | 48.9% |
| >2 Hours into Practice | 30,904 | 5.0% |
| Unknown | 153,852 | 24.8% |
| ***Total*** | ***620,485*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Injuries Evaluated By: | n=1,499,394 | % |
|---|---|---|
| Certified Athletic Trainer | 1,409,650 | 94.0% |
| Orthopedic Physician | 257,146 | 17.1% |
| Physician/Pediatrician | 195,016 | 13.0% |
| Other | 26,215 | 1.7% |
| Physician's Assistant | 24,194 | 1.6% |
| Nurse Practitioner | 12,958 | 0.9% |
| Chiropractor | 10,552 | 0.7% |
| Neurologist/Neuropsychologist | 9,305 | 0.6% |
| School Nurse | 4,452 | 0.3% |

| Assessment Method: | n=1,499,394 | % |
|---|---|---|
| Evaluation | 1,468,882 | 98.0% |
| X-Ray | 517,860 | 34.5% |
| MRI | 156,404 | 10.4% |
| CT-Scan | 25,627 | 1.7% |
| Other | 11,351 | 0.8% |
| Blood Work/Lab Test | 11,077 | 0.7% |

* Multiple responses allowed per injury report.

# III. Boys' Football Injury Epidemiology

**Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***1,376*** | ***384,982*** | ***3.57*** | ***562,530*** |
| Competition | 840 | 66,615 | 12.61 | 332,956 |
| Practice | 536 | 318,367 | 1.68 | 229,574 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 106,260 | 19.7% |
| Sophomore | 153,649 | 28.5% |
| Junior | 135,634 | 25.1% |
| Senior | 144,339 | 26.7% |
| ***Total*** | ***539,881*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 15.8 (1.2) |
| n | 456,207 |

| BMI | |
|---|---|
| Minimum | 17.2 |
| Maximum | 53.0 |
| Mean (SD) | 26.1 (5.2) |
| n | 314,898 |

* Throughout this chapter, totals and n's represent the total 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, 2023-24 School Year**

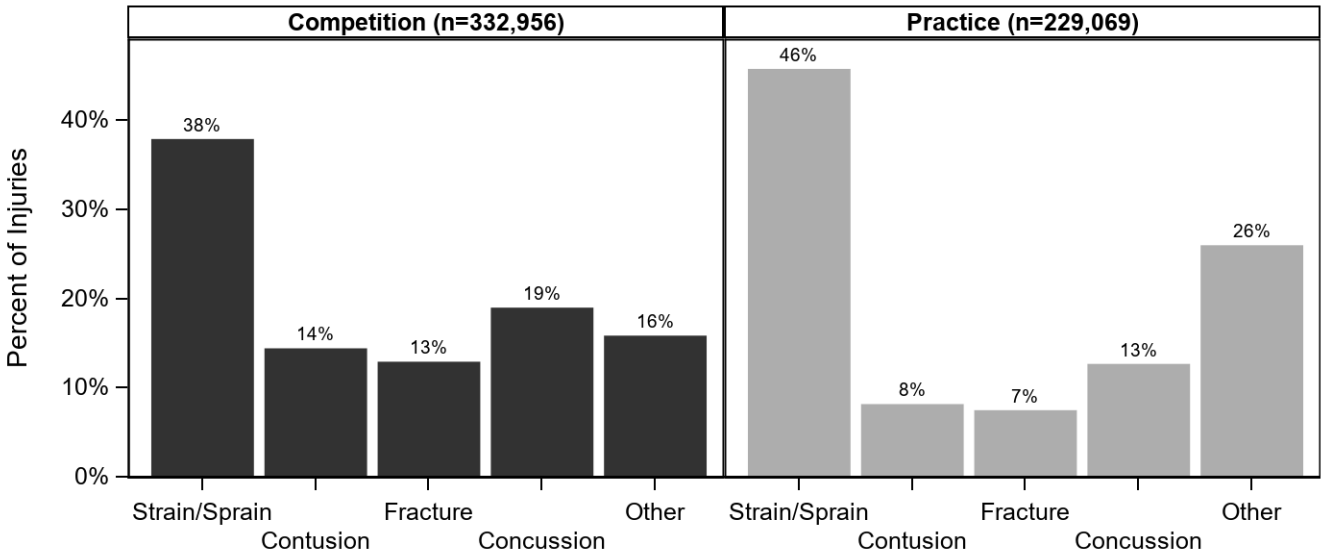



**Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face | 65,411 | 19.6% | 29,597 | 12.9% | 95,008 | 16.9% |
| Knee | 58,839 | 17.7% | 33,817 | 14.7% | 92,656 | 16.5% |
| Ankle | 41,668 | 12.5% | 29,045 | 12.7% | 70,713 | 12.6% |
| Hip/Thigh/Upper Leg | 23,119 | 6.9% | 35,109 | 15.3% | 58,227 | 10.4% |
| Hand/Wrist | 29,468 | 8.9% | 23,965 | 10.4% | 53,433 | 9.5% |
| Shoulder | 32,433 | 9.7% | 19,348 | 8.4% | 51,781 | 9.2% |
| Trunk | 16,441 | 4.9% | 15,537 | 6.8% | 31,978 | 5.7% |
| Foot | 14,062 | 4.2% | 13,777 | 6.0% | 27,840 | 4.9% |
| Lower Leg | 15,434 | 4.6% | 12,250 | 5.3% | 27,684 | 4.9% |
| Arm/Elbow | 15,325 | 4.6% | 7,497 | 3.3% | 22,823 | 4.1% |
| Other | 13,577 | 4.1% | 4,498 | 2.0% | 18,075 | 3.2% |
| Neck | 6,081 | 1.8% | 2,455 | 1.1% | 8,536 | 1.5% |
| Systemic | 1,098 | 0.3% | 2,679 | 1.2% | 3,777 | 0.7% |
| ***Total*** | ***332,956*** | ***100.0%*** | ***229,574*** | ***100.0%*** | ***562,530*** | ***100.0%*** |

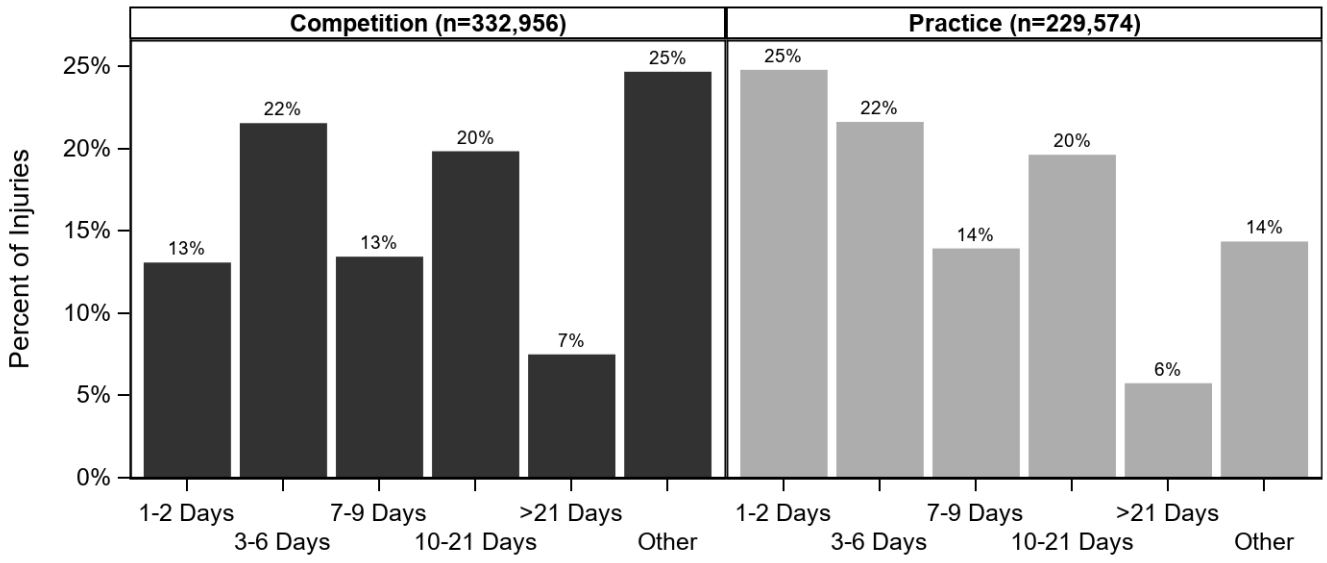
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=332,955) | | Practice (n=229,070) | | Overall (n=562,026) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face Concussion | 63,164 | 19.0% | 28,998 | 12.7% | 92,162 | 16.4% |
| Ankle Strain/Sprain | 35,327 | 10.6% | 23,898 | 10.4% | 59,226 | 10.5% |
| Knee Strain/Sprain | 37,454 | 11.2% | 11,846 | 5.2% | 49,300 | 8.8% |
| Hip/Thigh/Upper Leg Strain/Sprain | 11,588 | 3.5% | 29,900 | 13.1% | 41,488 | 7.4% |
| Knee Other | 11,947 | 3.6% | 18,520 | 8.1% | 30,467 | 5.4% |
| Shoulder Other | 17,343 | 5.2% | 7,879 | 3.4% | 25,222 | 4.5% |
| Hand/Wrist Fracture | 13,894 | 4.2% | 9,647 | 4.2% | 23,541 | 4.2% |
| Shoulder Strain/Sprain | 11,509 | 3.5% | 9,163 | 4.0% | 20,672 | 3.7% |
| Hand/Wrist Strain/Sprain | 8,243 | 2.5% | 7,429 | 3.2% | 15,672 | 2.8% |
| Other Fracture | 10,143 | 3.0% | 2,490 | 1.1% | 12,633 | 2.2% |

* Totals and n's represent the total 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 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 38,327 | 11.7% | 11,423 | 5.0% | 49,750 | 8.9% |
| Did Not Require Surgery | 289,637 | 88.3% | 217,060 | 95.0% | 506,697 | 91.1% |
| ***Total*** | ***327,964*** | ***100.0%*** | ***228,483*** | ***100.0%*** | ***556,447*** | ***100.0%*** |

* Totals and n's represent the total 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 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

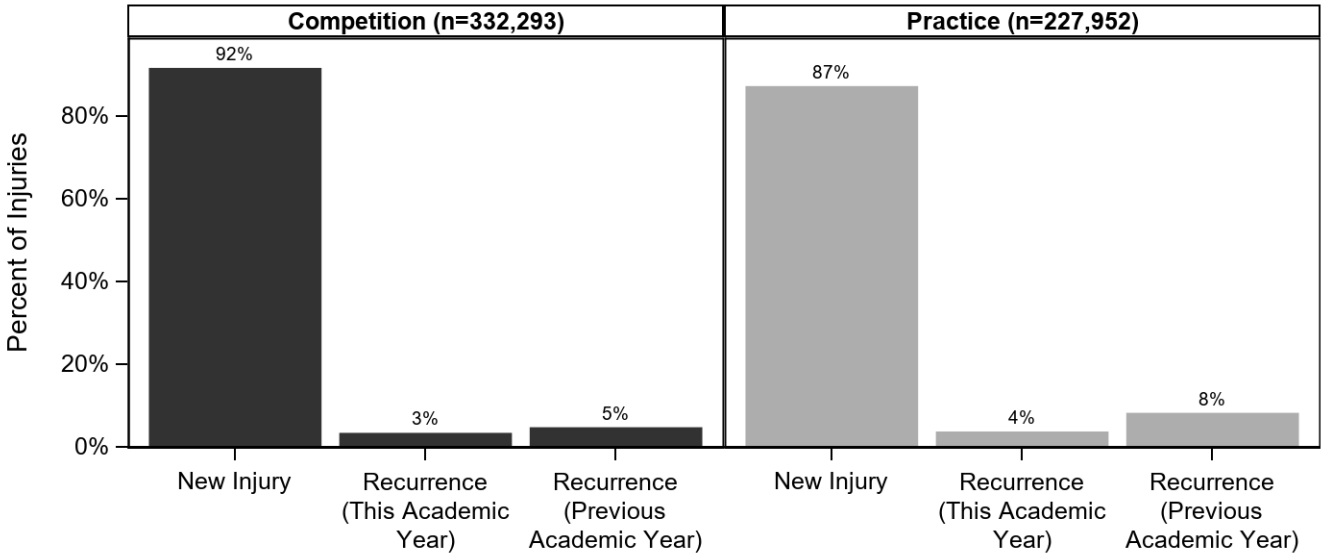


**Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 117,655 | 20.9% |
| Regular Season | 404,472 | 71.9% |
| Post Season | 33,176 | 5.9% |
| Unknown/Other | 7,228 | 1.3% |
| ***Total*** | ***562,530*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 3,569 | 1.2% |
| First Quarter | 39,148 | 12.8% |
| Second Quarter | 92,468 | 30.3% |
| Third Quarter | 92,502 | 30.4% |
| Fourth Quarter | 75,371 | 24.7% |
| Overtime | 1,634 | 0.5% |
| ***Total*** | ***304,692*** | ***100.0%*** |

| Field Location | | |
|---|---|---|
| End Zone | 5,816 | 1.9% |
| Red Zone (20 Yard Line to Goal Line) | 45,741 | 14.6% |
| Between the 20 Yard Lines | 164,231 | 52.4% |
| Off the Field | 2,220 | 0.7% |
| Unknown | 95,622 | 30.5% |
| ***Total*** | ***313,631*** | ***100.0%*** |

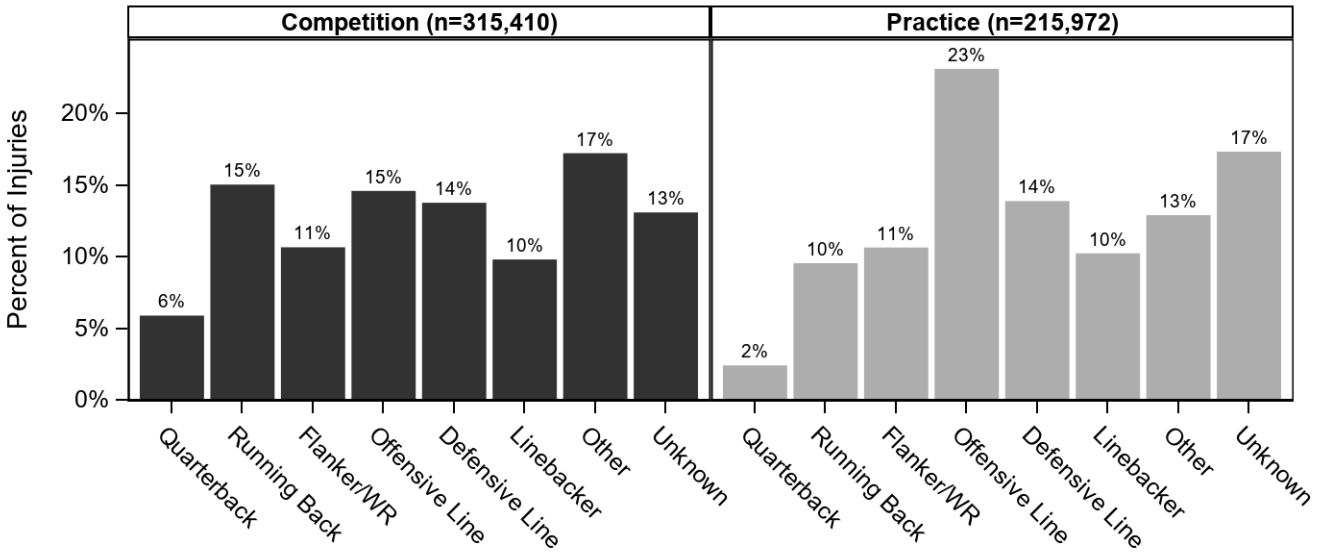
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 16,870 | 7.4% |
| Second 1/2 Hour | 28,972 | 12.8% |
| 1-2 Hours into Practice | 122,120 | 53.8% |
| >2 Hours into Practice | 20,084 | 8.8% |
| Unknown | 38,913 | 17.1% |
| ***Total*** | ***226,958*** | ***100.0%*** |

* Totals and n's represent the total 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 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**



REPORTING INFORMATION ONLINE

**Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Being Tackled | 91,071 | 28.7% | 25,822 | 11.8% | 116,893 | 21.8% |
| Tackling | 68,616 | 21.6% | 27,316 | 12.5% | 95,933 | 17.9% |
| Blocking | 44,387 | 14.0% | 33,672 | 15.4% | 78,059 | 14.6% |
| Unknown | 34,655 | 10.9% | 27,790 | 12.7% | 62,445 | 11.6% |
| Other | 12,297 | 3.9% | 28,064 | 12.8% | 40,360 | 7.5% |
| N/A ** | 8,321 | 2.6% | 31,321 | 14.3% | 39,642 | 7.4% |
| Being Blocked | 22,772 | 7.2% | 11,143 | 5.1% | 33,914 | 6.3% |
| Stepped On, Fell On or Kicked | 17,161 | 5.4% | 10,297 | 4.7% | 27,458 | 5.1% |
| Rotation Around a Planted Foot/Inversion | 14,470 | 4.6% | 11,433 | 5.2% | 25,903 | 4.8% |
| Contact with Blocking Sled/Dummy | 640 | 0.2% | 6,078 | 2.8% | 6,718 | 1.3% |
| Contact with Ball | 1,941 | 0.6% | 3,026 | 1.4% | 4,967 | 0.9% |
| Uneven Playing Surface | 1,166 | 0.4% | 2,508 | 1.1% | 3,674 | 0.7% |
| Contact with Seats, Bleacher or Table | 244 | 0.1% | 0 | 0.0% | 244 | 0.0% |
| ***Total*** | ***317,741*** | ***100.0%*** | ***218,469*** | ***100.0%*** | ***536,211*** | ***100.0%*** |

* Totals and n's represent the total 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.
** Includes overuse, heat illness, conditioning, etc.

REPORTING INFORMATION ONLINE

**Table 3.10 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Being Blocked | 10,302 | 4.7% | 6,647 | 10.8% | 3,511 | 6.0% | 9,769 | 11.5% | 3,686 | 3.4% |
| Being Tackled | 39,669 | 17.9% | 18,153 | 29.5% | 19,560 | 33.6% | 27,087 | 31.8% | 12,423 | 11.4% |
| Blocking | 32,334 | 14.6% | 7,450 | 12.1% | 8,350 | 14.3% | 12,977 | 15.2% | 16,947 | 15.5% |
| Contact with Ball | 505 | 0.2% | 0 | 0.0% | 2,803 | 4.8% | 0 | 0.0% | 1,659 | 1.5% |
| Contact with Blocking Sled/Dummy | 2,862 | 1.3% | 0 | 0.0% | 1,882 | 3.2% | 1,375 | 1.6% | 599 | 0.5% |
| Contact with Seats, Bleacher or Table | 0 | 0.0% | 244 | 0.4% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| N/A ** | 15,240 | 6.9% | 640 | 1.0% | 244 | 0.4% | 0 | 0.0% | 23,012 | 21.0% |
| Other | 24,828 | 11.2% | 1,850 | 3.0% | 4,780 | 8.2% | 995 | 1.2% | 7,907 | 7.2% |
| Rotation Around a Planted Foot/Inversion | 20,372 | 9.2% | 505 | 0.8% | 1,060 | 1.8% | 0 | 0.0% | 3,966 | 3.6% |
| Stepped On, Fell On or Kicked | 13,131 | 5.9% | 6,843 | 11.1% | 3,915 | 6.7% | 419 | 0.5% | 3,150 | 2.9% |
| Tackling | 33,025 | 14.9% | 10,857 | 17.7% | 6,230 | 10.7% | 21,482 | 25.2% | 24,340 | 22.3% |
| Uneven Playing Surface | 2,100 | 0.9% | 1,070 | 1.7% | 505 | 0.9% | 0 | 0.0% | 0 | 0.0% |
| Unknown | 27,037 | 12.2% | 7,242 | 11.8% | 5,355 | 9.2% | 11,129 | 13.1% | 11,681 | 10.7% |
| ***Total*** | ***221,404*** | ***100.0%*** | ***61,501*** | ***100.0%*** | ***58,196*** | ***100.0%*** | ***85,234*** | ***100.0%*** | ***109,371*** | ***100.0%*** |

* Totals and n's represent the total 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.
** Includes overuse, heat illness, conditioning, etc.

# IV. Boys' Soccer Injury Epidemiology

**Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***312*** | ***165,311*** | ***1.89*** | ***192,806*** |
| Competition | 196 | 49,236 | 3.98 | 118,247 |
| Practice | 116 | 116,075 | 1.00 | 74,559 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 36,045 | 19.9% |
| Sophomore | 47,725 | 26.4% |
| Junior | 50,281 | 27.8% |
| Senior | 46,790 | 25.9% |
| ***Total*** | ***180,841*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 15.9 (1.2) |
| n | 167,701 |

| BMI | |
|---|---|
| Minimum | 17.1 |
| Maximum | 34.5 |
| Mean (SD) | 22.8 (3.3) |
| n | 123,030 |

* Throughout this chapter, totals and n's represent the total 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 4.1 Diagnosis of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

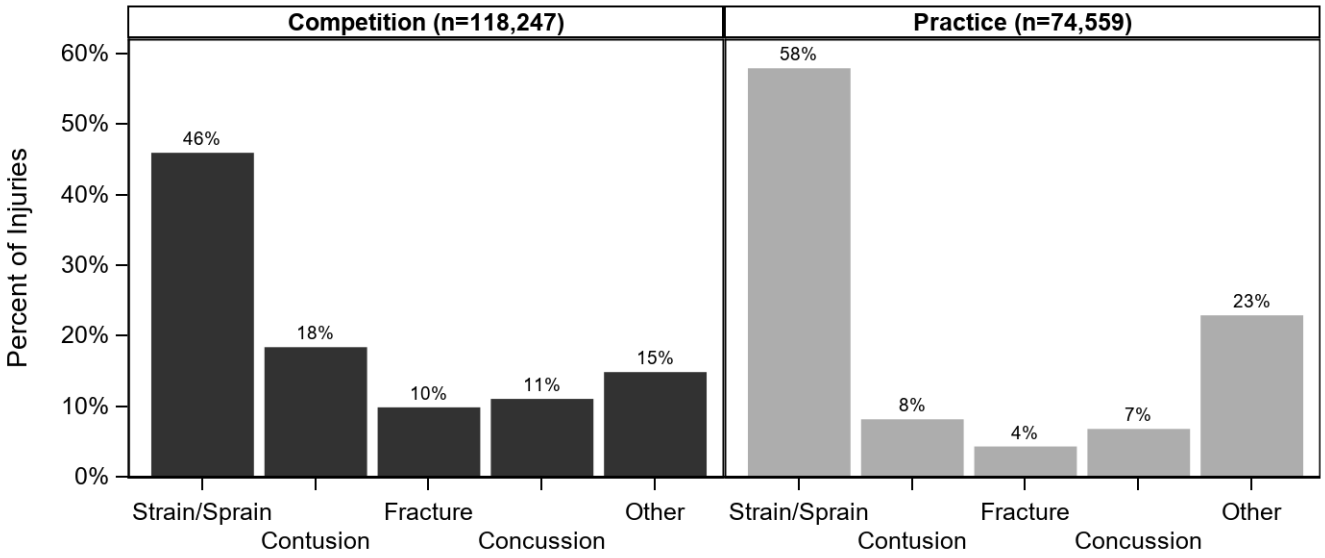



**Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle | 23,741 | 20.1% | 19,038 | 25.5% | 42,779 | 22.2% |
| Knee | 19,868 | 16.8% | 15,201 | 20.4% | 35,068 | 18.2% |
| Hip/Thigh/Upper Leg | 18,777 | 15.9% | 15,725 | 21.1% | 34,502 | 17.9% |
| Head/Face | 19,161 | 16.2% | 5,052 | 6.8% | 24,213 | 12.6% |
| Lower Leg | 9,504 | 8.0% | 6,361 | 8.5% | 15,865 | 8.2% |
| Foot | 9,544 | 8.1% | 4,973 | 6.7% | 14,517 | 7.5% |
| Trunk | 4,380 | 3.7% | 3,950 | 5.3% | 8,329 | 4.3% |
| Hand/Wrist | 3,076 | 2.6% | 3,347 | 4.5% | 6,423 | 3.3% |
| Other | 3,052 | 2.6% | 668 | 0.9% | 3,720 | 1.9% |
| Arm/Elbow | 3,040 | 2.6% | 0 | 0.0% | 3,040 | 1.6% |
| Neck | 1,777 | 1.5% | 244 | 0.3% | 2,021 | 1.0% |
| Shoulder | 1,841 | 1.6% | 0 | 0.0% | 1,841 | 1.0% |
| Systemic | 488 | 0.4% | 0 | 0.0% | 488 | 0.3% |
| ***Total*** | ***118,247*** | ***100.0%*** | ***74,559*** | ***100.0%*** | ***192,806*** | ***100.0%*** |

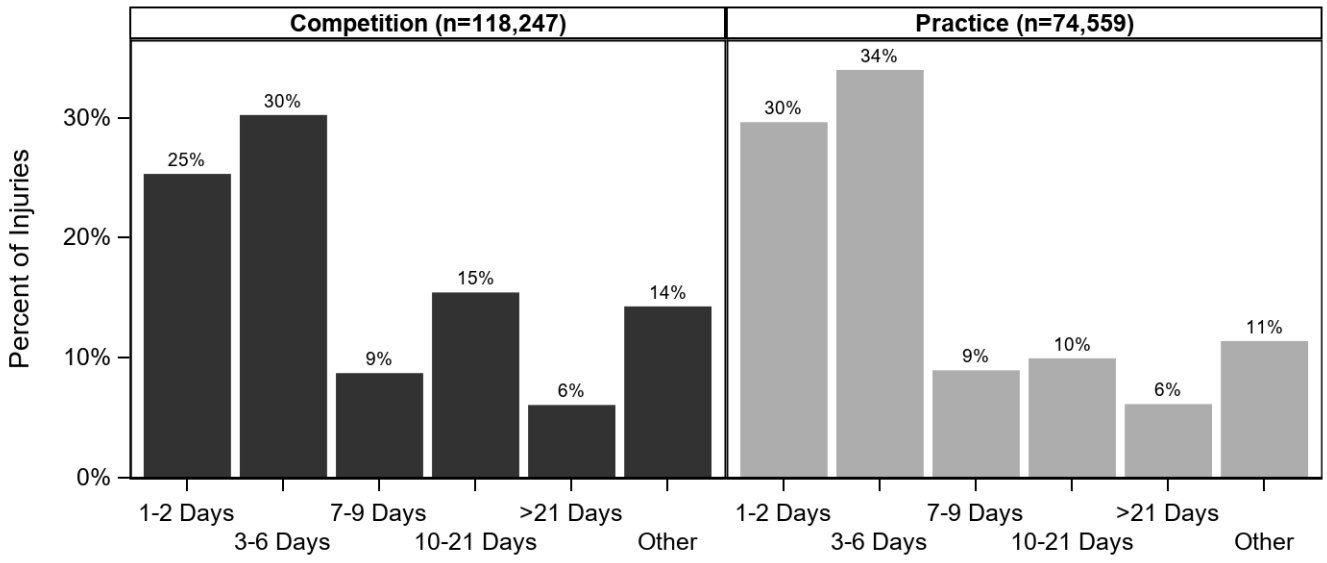
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=118,245) | | Practice (n=74,557) | | Overall (n=192,806) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle Strain/Sprain | 19,466 | 16.5% | 14,446 | 19.4% | 33,913 | 17.6% |
| Hip/Thigh/Upper Leg Strain/Sprain | 12,999 | 11.0% | 14,399 | 19.3% | 27,398 | 14.2% |
| Head/Face Concussion | 13,047 | 11.0% | 5,052 | 6.8% | 18,099 | 9.4% |
| Knee Other | 7,210 | 6.1% | 9,251 | 12.4% | 16,461 | 8.5% |
| Knee Strain/Sprain | 7,775 | 6.6% | 5,037 | 6.8% | 12,812 | 6.6% |
| Foot Contusion | 3,626 | 3.1% | 3,117 | 4.2% | 6,743 | 3.5% |
| Trunk Strain/Sprain | 3,043 | 2.6% | 2,796 | 3.8% | 5,839 | 3.0% |
| Knee Contusion | 4,883 | 4.1% | 668 | 0.9% | 5,552 | 2.9% |
| Lower Leg Strain/Sprain | 2,217 | 1.9% | 2,680 | 3.6% | 4,898 | 2.5% |
| Hip/Thigh/Upper Leg Contusion | 4,815 | 4.1% | 79 | 0.1% | 4,894 | 2.5% |

* Totals and n's represent the total 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 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 5,219 | 4.4% | 3,375 | 4.6% | 8,593 | 4.5% |
| Did Not Require Surgery | 113,029 | 95.6% | 69,844 | 95.4% | 182,873 | 95.5% |
| ***Total*** | ***118,247*** | ***100.0%*** | ***73,219*** | ***100.0%*** | ***191,466*** | ***100.0%*** |

* Totals and n's represent the total 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 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

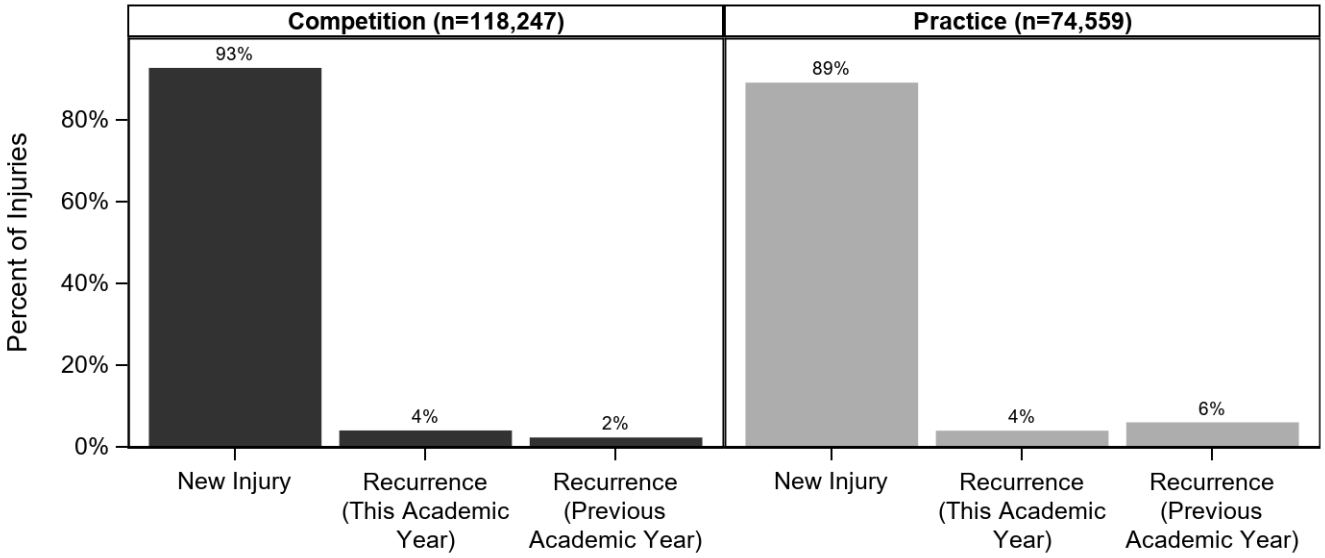


**Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 28,121 | 14.6% |
| Regular Season | 156,484 | 81.3% |
| Post Season | 7,289 | 3.8% |
| Unknown/Other | 668 | 0.3% |
| ***Total*** | ***192,562*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 2,969 | 2.7% |
| First Half | 19,304 | 17.5% |
| Second Half | 60,128 | 54.4% |
| Overtime | 236 | 0.2% |
| Unknown | 27,941 | 25.3% |
| ***Total*** | ***110,579*** | ***100.0%*** |

| Field Location | | |
|---|---|---|
| Goal Box (Defense) | 13,150 | 12.0% |
| Goal Box (Offense) | 6,078 | 5.6% |
| Side of Goal Box (Defense) | 8,050 | 7.4% |
| Side of Goal Box (Offense) | 9,766 | 8.9% |
| Top of Goal Box Extended to Center Line (Offense) | 19,756 | 18.1% |
| Top of Goal Box Extended to Center Line (Defense) | 9,512 | 8.7% |
| Off the Field | 912 | 0.8% |
| Unknown | 42,014 | 38.5% |
| ***Total*** | ***109,238*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 3,977 | 5.3% |
| Second 1/2 Hour | 7,382 | 9.9% |
| 1-2 Hours into Practice | 44,278 | 59.4% |
| >2 Hours into Practice | 2,249 | 3.0% |
| Unknown | 16,594 | 22.3% |
| ***Total*** | ***74,480*** | ***100.0%*** |

* Totals and n's represent the total 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 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

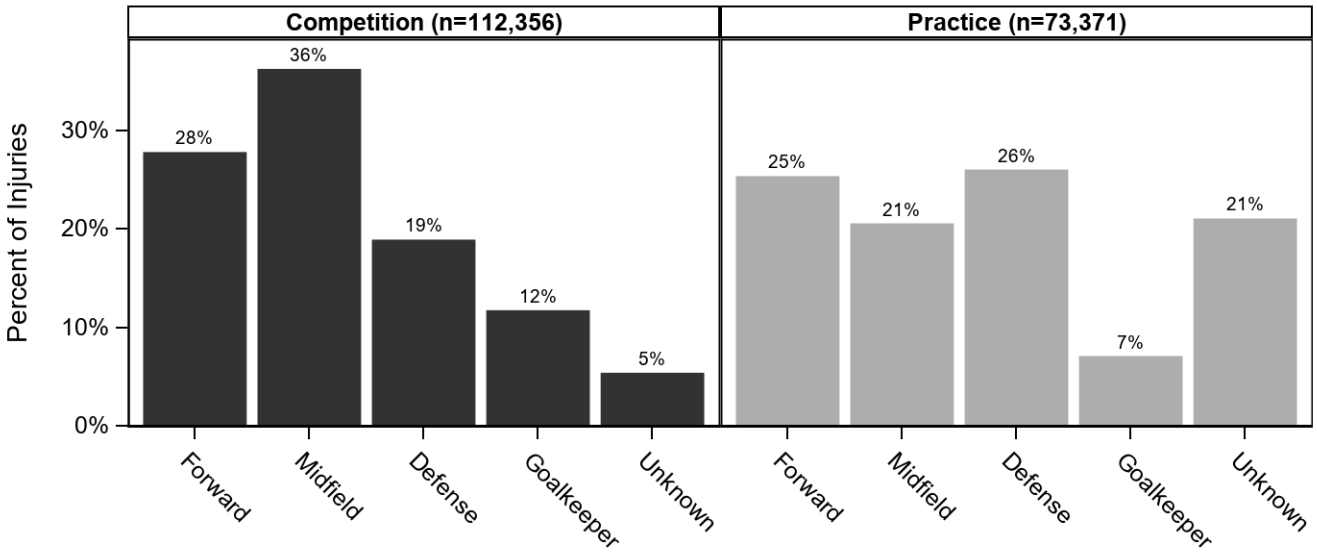


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**Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| General Play | 24,251 | 21.6% | 29,037 | 39.0% | 53,287 | 28.6% |
| Defending | 16,748 | 14.9% | 7,697 | 10.3% | 24,444 | 13.1% |
| Ball Handling/Dribbling | 14,804 | 13.2% | 1,961 | 2.6% | 16,765 | 9.0% |
| Chasing Loose Ball | 14,359 | 12.8% | 2,139 | 2.9% | 16,498 | 8.8% |
| Unknown | 6,672 | 6.0% | 9,623 | 12.9% | 16,295 | 8.7% |
| Shooting | 5,432 | 4.8% | 8,746 | 11.7% | 14,178 | 7.6% |
| Goaltending | 8,270 | 7.4% | 4,006 | 5.4% | 12,276 | 6.6% |
| Heading Ball | 6,475 | 5.8% | 747 | 1.0% | 7,222 | 3.9% |
| Passing | 5,369 | 4.8% | 668 | 0.9% | 6,037 | 3.2% |
| Other | 2,689 | 2.4% | 2,009 | 2.7% | 4,699 | 2.5% |
| Conditioning | 0 | 0.0% | 4,521 | 6.1% | 4,521 | 2.4% |
| Receiving Pass | 1,517 | 1.4% | 2,217 | 3.0% | 3,734 | 2.0% |
| Blocking Shot | 2,217 | 2.0% | 1,109 | 1.5% | 3,326 | 1.8% |
| Attempting a Slide Tackle | 2,833 | 2.5% | 0 | 0.0% | 2,833 | 1.5% |
| Receiving a Slide Tackle | 488 | 0.4% | 0 | 0.0% | 488 | 0.3% |
| ***Total*** | ***112,124*** | ***100.0%*** | ***74,480*** | ***100.0%*** | ***186,604*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 4.10 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Attempting a Slide Tackle | 579 | 0.6% | 0 | 0.0% | 579 | 3.9% | 0 | 0.0% | 1,676 | 4.8% |
| Ball Handling/Dribbling | 7,126 | 7.5% | 5,146 | 21.1% | 1,233 | 8.3% | 3,261 | 18.1% | 0 | 0.0% |
| Blocking Shot | 3,326 | 3.5% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Chasing Loose Ball | 11,652 | 12.3% | 1,157 | 4.7% | 2,072 | 14.0% | 231 | 1.3% | 1,385 | 4.0% |
| Conditioning | 2,087 | 2.2% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 2,434 | 7.0% |
| Defending | 12,168 | 12.8% | 5,702 | 23.4% | 1,388 | 9.4% | 2,391 | 13.3% | 2,796 | 8.1% |
| General Play | 28,313 | 29.9% | 5,218 | 21.4% | 1,398 | 9.4% | 1,431 | 7.9% | 16,927 | 48.9% |
| Goaltending | 2,473 | 2.6% | 2,434 | 10.0% | 1,067 | 7.2% | 4,718 | 26.2% | 1,584 | 4.6% |
| Heading Ball | 1,675 | 1.8% | 579 | 2.4% | 579 | 3.9% | 2,136 | 11.9% | 2,253 | 6.5% |
| Other | 2,689 | 2.8% | 0 | 0.0% | 0 | 0.0% | 1,765 | 9.8% | 244 | 0.7% |
| Passing | 3,786 | 4.0% | 1,097 | 4.5% | 1,154 | 7.8% | 0 | 0.0% | 0 | 0.0% |
| Receiving Pass | 1,340 | 1.4% | 463 | 1.9% | 823 | 5.5% | 1,109 | 6.2% | 0 | 0.0% |
| Receiving a Slide Tackle | 244 | 0.3% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 244 | 0.7% |
| Shooting | 9,128 | 9.6% | 1,931 | 7.9% | 2,010 | 13.6% | 0 | 0.0% | 1,109 | 3.2% |
| Unknown | 8,182 | 8.6% | 657 | 2.7% | 2,527 | 17.0% | 979 | 5.4% | 3,950 | 11.4% |
| ***Total*** | ***94,770*** | ***100.0%*** | ***24,384*** | ***100.0%*** | ***14,828*** | ***100.0%*** | ***18,021*** | ***100.0%*** | ***34,601*** | ***100.0%*** |

* Totals and n's represent the total 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.

# V. Girls' Soccer Injury Epidemiology

**Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***381*** | ***141,477*** | ***2.69*** | ***205,801*** |
| Competition | 250 | 42,848 | 5.83 | 130,307 |
| Practice | 131 | 98,629 | 1.33 | 75,494 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 46,415 | 23.8% |
| Sophomore | 60,226 | 30.9% |
| Junior | 55,708 | 28.6% |
| Senior | 32,278 | 16.6% |
| ***Total*** | ***194,627*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 15.5 (1.2) |
| n | 164,043 |

| BMI | |
|---|---|
| Minimum | 15.8 |
| Maximum | 32.8 |
| Mean (SD) | 22.2 (3.3) |
| n | 118,389 |

* Throughout this chapter, totals and n's represent the total 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, 2023-24 School Year**

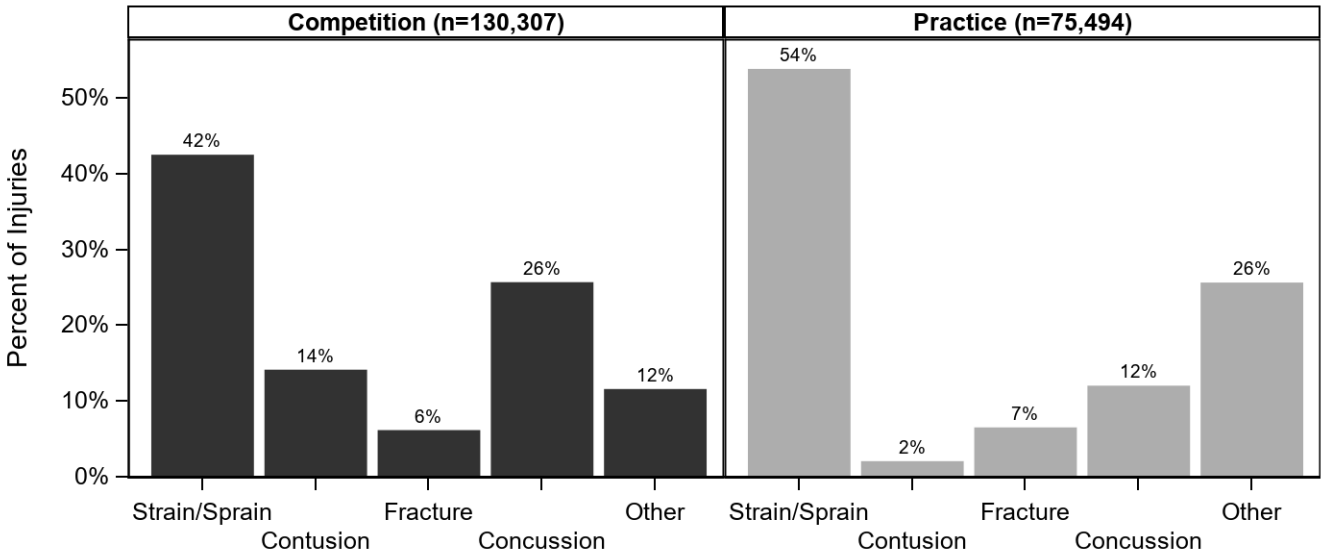


**Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face | 35,752 | 27.4% | 9,150 | 12.1% | 44,902 | 21.8% |
| Ankle | 28,829 | 22.1% | 16,031 | 21.2% | 44,860 | 21.8% |
| Knee | 28,031 | 21.5% | 9,335 | 12.4% | 37,366 | 18.2% |
| Hip/Thigh/Upper Leg | 15,403 | 11.8% | 16,457 | 21.8% | 31,861 | 15.5% |
| Lower Leg | 5,477 | 4.2% | 5,832 | 7.7% | 11,309 | 5.5% |
| Foot | 5,045 | 3.9% | 5,182 | 6.9% | 10,227 | 5.0% |
| Hand/Wrist | 6,001 | 4.6% | 3,778 | 5.0% | 9,779 | 4.8% |
| Systemic | 820 | 0.6% | 4,380 | 5.8% | 5,200 | 2.5% |
| Trunk | 767 | 0.6% | 4,207 | 5.6% | 4,973 | 2.4% |
| Other | 1,810 | 1.4% | 571 | 0.8% | 2,380 | 1.2% |
| Shoulder | 2,031 | 1.6% | 0 | 0.0% | 2,031 | 1.0% |
| Arm/Elbow | 262 | 0.2% | 571 | 0.8% | 833 | 0.4% |
| Neck | 80 | 0.1% | 0 | 0.0% | 80 | 0.0% |
| ***Total*** | ***130,307*** | ***100.0%*** | ***75,494*** | ***100.0%*** | ***205,801*** | ***100.0%*** |

* Totals and n's represent the total 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.

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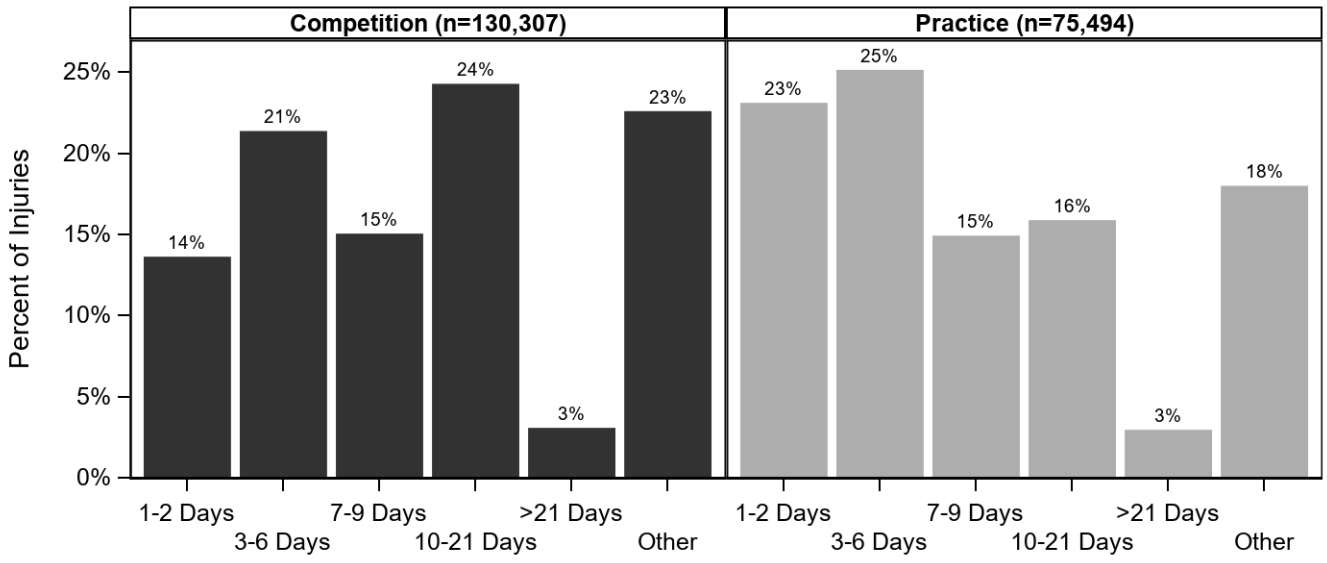
**Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=130,310) | | Practice (n=75,495) | | Overall (n=205,802) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face Concussion | 33,450 | 25.7% | 9,070 | 12.0% | 42,520 | 20.7% |
| Ankle Strain/Sprain | 24,035 | 18.4% | 15,952 | 21.1% | 39,986 | 19.4% |
| Hip/Thigh/Upper Leg Strain/Sprain | 11,148 | 8.6% | 15,714 | 20.8% | 26,862 | 13.1% |
| Knee Strain/Sprain | 14,119 | 10.8% | 2,376 | 3.1% | 16,494 | 8.0% |
| Knee Other | 6,440 | 4.9% | 5,489 | 7.3% | 11,929 | 5.8% |
| Knee Contusion | 7,473 | 5.7% | 1,470 | 1.9% | 8,943 | 4.3% |
| Lower Leg Other | 1,646 | 1.3% | 5,590 | 7.4% | 7,236 | 3.5% |
| Hand/Wrist Fracture | 3,142 | 2.4% | 2,382 | 3.2% | 5,523 | 2.7% |
| Systemic Other | 820 | 0.6% | 4,380 | 5.8% | 5,200 | 2.5% |
| Hip/Thigh/Upper Leg Contusion | 3,509 | 2.7% | 0 | 0.0% | 3,509 | 1.7% |

* Totals and n's represent the total 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 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 7,908 | 6.1% | 1,476 | 2.0% | 9,384 | 4.6% |
| Did Not Require Surgery | 122,137 | 93.9% | 74,018 | 98.0% | 196,155 | 95.4% |
| ***Total*** | ***130,044*** | ***100.0%*** | ***75,494*** | ***100.0%*** | ***205,539*** | ***100.0%*** |

* Totals and n's represent the total 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 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

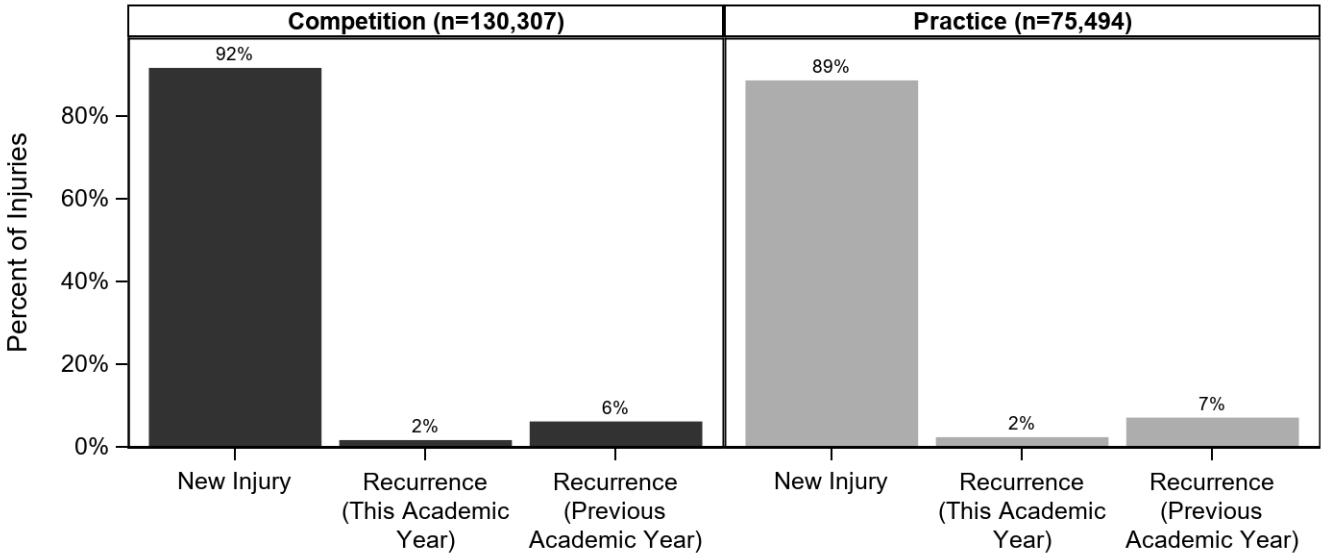


**Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 34,564 | 16.9% |
| Regular Season | 159,569 | 77.8% |
| Post Season | 10,134 | 4.9% |
| Unknown/Other | 715 | 0.3% |
| ***Total*** | ***204,981*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 4,853 | 3.9% |
| First Half | 20,733 | 16.7% |
| Second Half | 70,975 | 57.3% |
| Unknown | 27,376 | 22.1% |
| ***Total*** | ***123,938*** | ***100.0%*** |

| Field Location | | |
|---|---|---|
| Goal Box (Defense) | 12,895 | 10.4% |
| Goal Box (Offense) | 11,346 | 9.1% |
| Side of Goal Box (Defense) | 5,125 | 4.1% |
| Side of Goal Box (Offense) | 10,013 | 8.1% |
| Top of Goal Box Extended to Center Line (Offense) | 24,228 | 19.5% |
| Top of Goal Box Extended to Center Line (Defense) | 15,671 | 12.6% |
| Off the Field | 2,347 | 1.9% |
| Unknown | 42,567 | 34.3% |
| ***Total*** | ***124,193*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 6,545 | 8.7% |
| Second 1/2 Hour | 11,500 | 15.2% |
| 1-2 Hours into Practice | 26,527 | 35.2% |
| >2 Hours into Practice | 954 | 1.3% |
| Unknown | 29,889 | 39.6% |
| ***Total*** | ***75,415*** | ***100.0%*** |

* Totals and n's represent the total 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 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

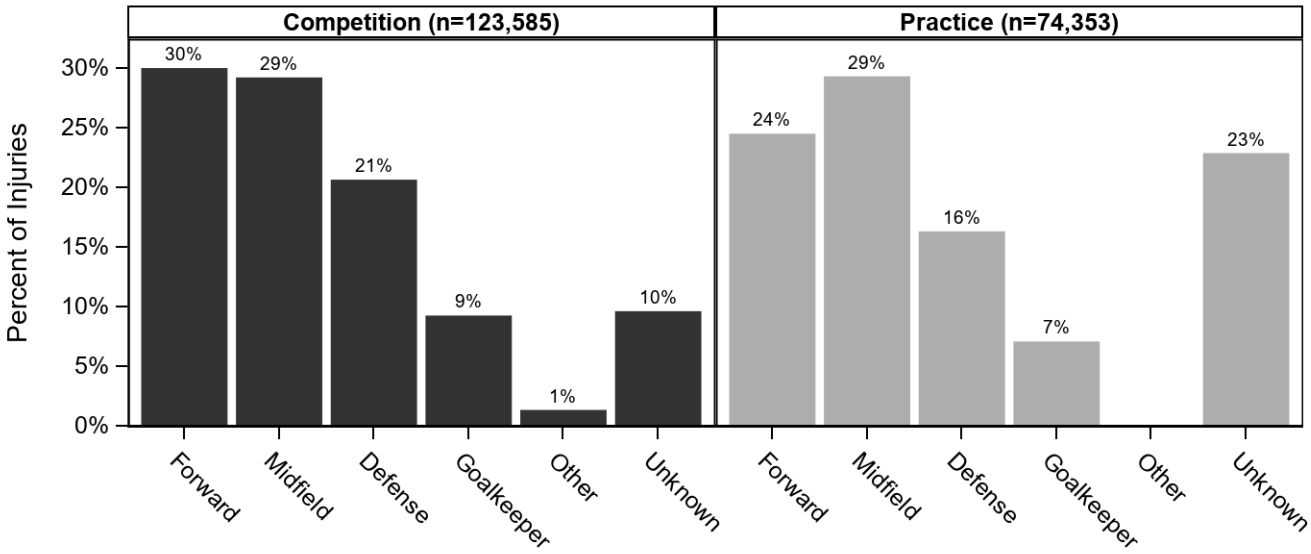


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**Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| General Play | 24,478 | 19.7% | 30,423 | 40.8% | 54,901 | 27.6% |
| Unknown | 18,293 | 14.7% | 8,778 | 11.8% | 27,072 | 13.6% |
| Defending | 18,029 | 14.5% | 5,882 | 7.9% | 23,911 | 12.0% |
| Chasing Loose Ball | 17,824 | 14.3% | 3,830 | 5.1% | 21,654 | 10.9% |
| Ball Handling/Dribbling | 11,161 | 9.0% | 3,757 | 5.0% | 14,918 | 7.5% |
| Goaltending | 9,292 | 7.5% | 3,929 | 5.3% | 13,220 | 6.6% |
| Conditioning | 0 | 0.0% | 9,307 | 12.5% | 9,307 | 4.7% |
| Shooting | 5,141 | 4.1% | 3,194 | 4.3% | 8,335 | 4.2% |
| Other | 4,255 | 3.4% | 3,712 | 5.0% | 7,968 | 4.0% |
| Heading Ball | 5,850 | 4.7% | 1,541 | 2.1% | 7,391 | 3.7% |
| Receiving a Slide Tackle | 3,326 | 2.7% | 0 | 0.0% | 3,326 | 1.7% |
| Receiving Pass | 2,669 | 2.1% | 242 | 0.3% | 2,911 | 1.5% |
| Blocking Shot | 2,589 | 2.1% | 0 | 0.0% | 2,589 | 1.3% |
| Passing | 833 | 0.7% | 0 | 0.0% | 833 | 0.4% |
| Attempting a Slide Tackle | 571 | 0.5% | 0 | 0.0% | 571 | 0.3% |
| ***Total*** | ***124,311*** | ***100.0%*** | ***74,595*** | ***100.0%*** | ***198,905*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 5.10 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Attempting a Slide Tackle | 0 | 0.0% | 571 | 3.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Ball Handling/Dribbling | 11,271 | 12.2% | 977 | 5.1% | 820 | 6.3% | 1,062 | 2.6% | 787 | 2.3% |
| Blocking Shot | 1,769 | 1.9% | 820 | 4.3% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Chasing Loose Ball | 9,418 | 10.2% | 1,141 | 6.0% | 2,506 | 19.4% | 7,494 | 18.6% | 1,095 | 3.2% |
| Conditioning | 4,427 | 4.8% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 4,880 | 14.2% |
| Defending | 6,856 | 7.4% | 4,420 | 23.1% | 2,118 | 16.4% | 8,058 | 20.0% | 2,458 | 7.2% |
| General Play | 27,204 | 29.5% | 5,080 | 26.6% | 2,761 | 21.4% | 3,273 | 8.1% | 16,583 | 48.3% |
| Goaltending | 4,819 | 5.2% | 1,712 | 8.9% | 1,147 | 8.9% | 5,543 | 13.8% | 0 | 0.0% |
| Heading Ball | 242 | 0.3% | 242 | 1.3% | 0 | 0.0% | 6,907 | 17.2% | 0 | 0.0% |
| Other | 2,695 | 2.9% | 820 | 4.3% | 0 | 0.0% | 2,105 | 5.2% | 2,347 | 6.8% |
| Passing | 262 | 0.3% | 571 | 3.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Receiving Pass | 1,286 | 1.4% | 80 | 0.4% | 0 | 0.0% | 1,545 | 3.8% | 0 | 0.0% |
| Receiving a Slide Tackle | 1,856 | 2.0% | 900 | 4.7% | 571 | 4.4% | 0 | 0.0% | 0 | 0.0% |
| Shooting | 6,864 | 7.4% | 80 | 0.4% | 0 | 0.0% | 0 | 0.0% | 1,391 | 4.0% |
| Unknown | 13,285 | 14.4% | 1,720 | 9.0% | 3,005 | 23.2% | 4,263 | 10.6% | 4,798 | 14.0% |
| ***Total*** | ***92,255*** | ***100.0%*** | ***19,132*** | ***100.0%*** | ***12,929*** | ***100.0%*** | ***40,250*** | ***100.0%*** | ***34,340*** | ***100.0%*** |

* Totals and n's represent the total 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.

# VI. Girls' Volleyball Injury Epidemiology

**Table 6.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***140*** | ***136,754*** | ***1.02*** | ***60,718*** |
| Competition | 54 | 48,821 | 1.11 | 23,122 |
| Practice | 86 | 87,933 | 0.98 | 37,596 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 6.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 19,430 | 33.3% |
| Sophomore | 10,795 | 18.5% |
| Junior | 14,449 | 24.8% |
| Senior | 13,690 | 23.5% |
| ***Total*** | ***58,364*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 15.5 (1.3) |
| n | 51,715 |

| BMI | |
|---|---|
| Minimum | 15.2 |
| Maximum | 33.8 |
| Mean (SD) | 21.8 (3.2) |
| n | 33,993 |

* Throughout this chapter, totals and n's represent the total 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 Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

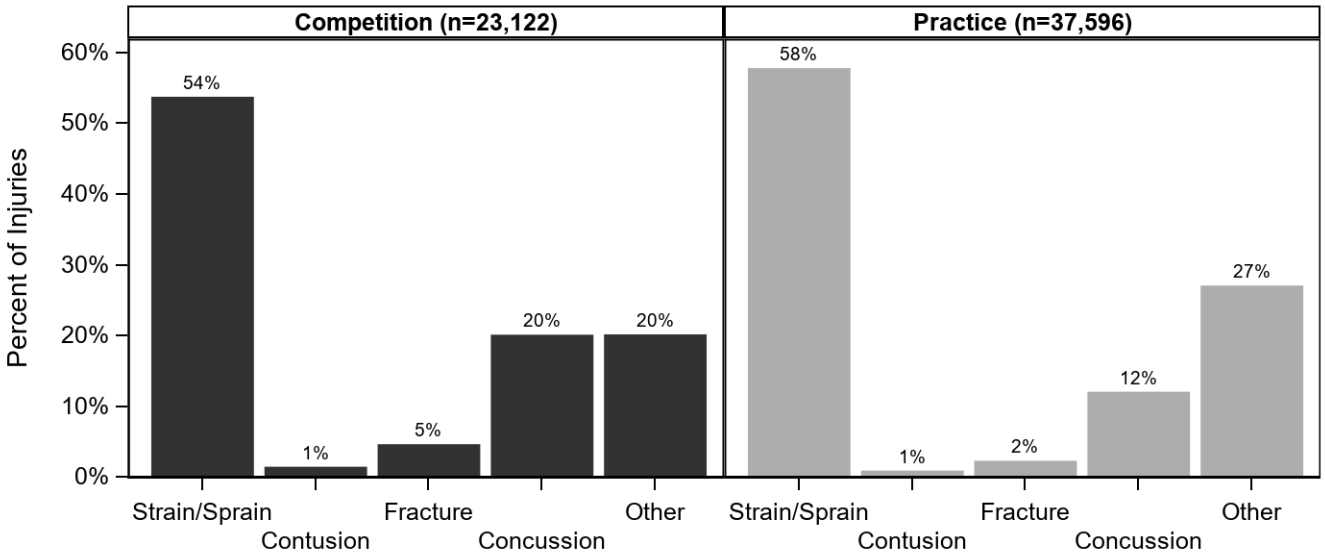



**Table 6.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle | 8,830 | 38.2% | 12,220 | 32.5% | 21,051 | 34.7% |
| Head/Face | 5,244 | 22.7% | 4,521 | 12.0% | 9,766 | 16.1% |
| Hand/Wrist | 2,771 | 12.0% | 4,602 | 12.2% | 7,373 | 12.1% |
| Knee | 3,499 | 15.1% | 2,792 | 7.4% | 6,291 | 10.4% |
| Trunk | 1,573 | 6.8% | 4,225 | 11.2% | 5,798 | 9.5% |
| Lower Leg | 602 | 2.6% | 2,355 | 6.3% | 2,956 | 4.9% |
| Hip/Thigh/Upper Leg | 0 | 0.0% | 2,158 | 5.7% | 2,158 | 3.6% |
| Arm/Elbow | 602 | 2.6% | 1,445 | 3.8% | 2,047 | 3.4% |
| Shoulder | 0 | 0.0% | 1,927 | 5.1% | 1,927 | 3.2% |
| Foot | 0 | 0.0% | 1,025 | 2.7% | 1,025 | 1.7% |
| Neck | 0 | 0.0% | 327 | 0.9% | 327 | 0.5% |
| ***Total*** | ***23,122*** | ***100.0%*** | ***37,596*** | ***100.0%*** | ***60,718*** | ***100.0%*** |

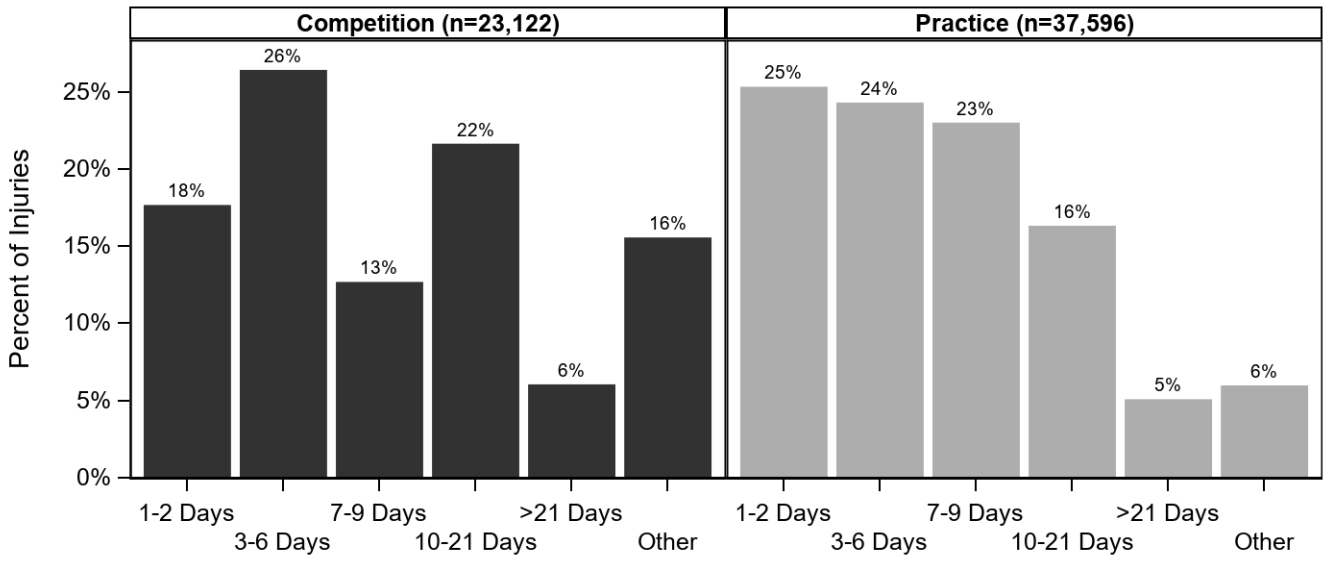
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 6.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=23,124) | | Practice (n=37,596) | | Overall (n=60,719) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle Strain/Sprain | 7,972 | 34.5% | 11,881 | 31.6% | 19,854 | 32.7% |
| Head/Face Concussion | 4,646 | 20.1% | 4,521 | 12.0% | 9,167 | 15.1% |
| Knee Other | 2,210 | 9.6% | 2,578 | 6.9% | 4,788 | 7.9% |
| Hand/Wrist Strain/Sprain | 1,921 | 8.3% | 2,506 | 6.7% | 4,427 | 7.3% |
| Trunk Strain/Sprain | 645 | 2.8% | 2,093 | 5.6% | 2,738 | 4.5% |
| Trunk Other | 602 | 2.6% | 2,132 | 5.7% | 2,733 | 4.5% |
| Hip/Thigh/Upper Leg Strain/Sprain | 0 | 0.0% | 2,158 | 5.7% | 2,158 | 3.6% |
| Lower Leg Other | 602 | 2.6% | 1,230 | 3.3% | 1,831 | 3.0% |
| Hand/Wrist Fracture | 850 | 3.7% | 850 | 2.3% | 1,700 | 2.8% |
| Arm/Elbow Strain/Sprain | 602 | 2.6% | 1,022 | 2.7% | 1,624 | 2.7% |

* Totals and n's represent the total 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 6.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Girls' Volleyball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 653 | 3.0% | 427 | 1.2% | 1,080 | 1.8% |
| Did Not Require Surgery | 21,343 | 97.0% | 36,241 | 98.8% | 57,585 | 98.2% |
| ***Total*** | ***21,997*** | ***100.0%*** | ***36,668*** | ***100.0%*** | ***58,665*** | ***100.0%*** |

* Totals and n's represent the total 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 6.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

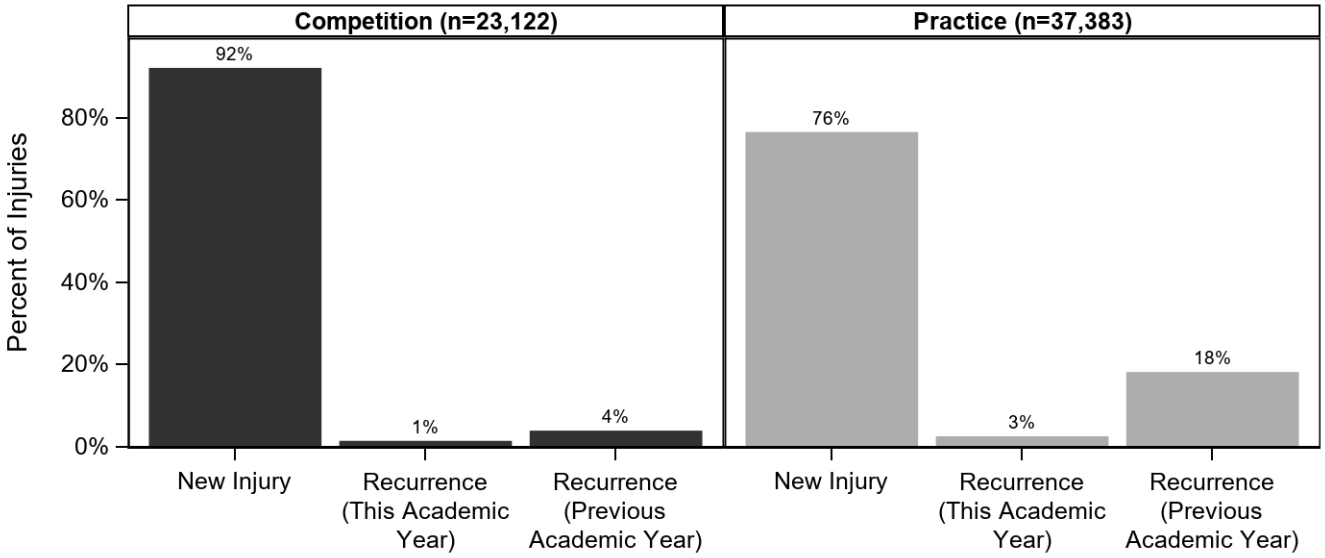


**Table 6.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 12,704 | 20.9% |
| Regular Season | 45,382 | 74.7% |
| Post Season | 2,306 | 3.8% |
| Unknown/Other | 327 | 0.5% |
| ***Total*** | ***60,718*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 6.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 5,043 | 22.4% |
| First Game | 1,282 | 5.7% |
| Second Game | 7,390 | 32.8% |
| Third Game | 2,886 | 12.8% |
| Fourth Game | 327 | 1.4% |
| Unknown | 5,610 | 24.9% |
| ***Total*** | ***22,537*** | ***100.0%*** |

| Court Location | | |
|---|---|---|
| Right Back (Server) | 213 | 0.9% |
| Right Forward | 2,743 | 12.2% |
| Outside Court (Your Side) | 1,243 | 5.5% |
| Outside Court (Opponents Side) | 599 | 2.7% |
| Middle Forward | 3,444 | 15.3% |
| Left Forward | 2,028 | 9.0% |
| Left Back | 1,734 | 7.7% |
| Outside the Playable Area | 1,411 | 6.3% |
| At the Net | 2,094 | 9.3% |
| Unknown | 7,028 | 31.2% |
| ***Total*** | ***22,537*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 6.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 2,042 | 5.5% |
| Second 1/2 Hour | 8,442 | 22.6% |
| 1-2 Hours into Practice | 14,846 | 39.7% |
| >2 Hours into Practice | 2,271 | 6.1% |
| Unknown | 9,782 | 26.2% |
| ***Total*** | ***37,383*** | ***100.0%*** |

* Totals and n's represent the total 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 6.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

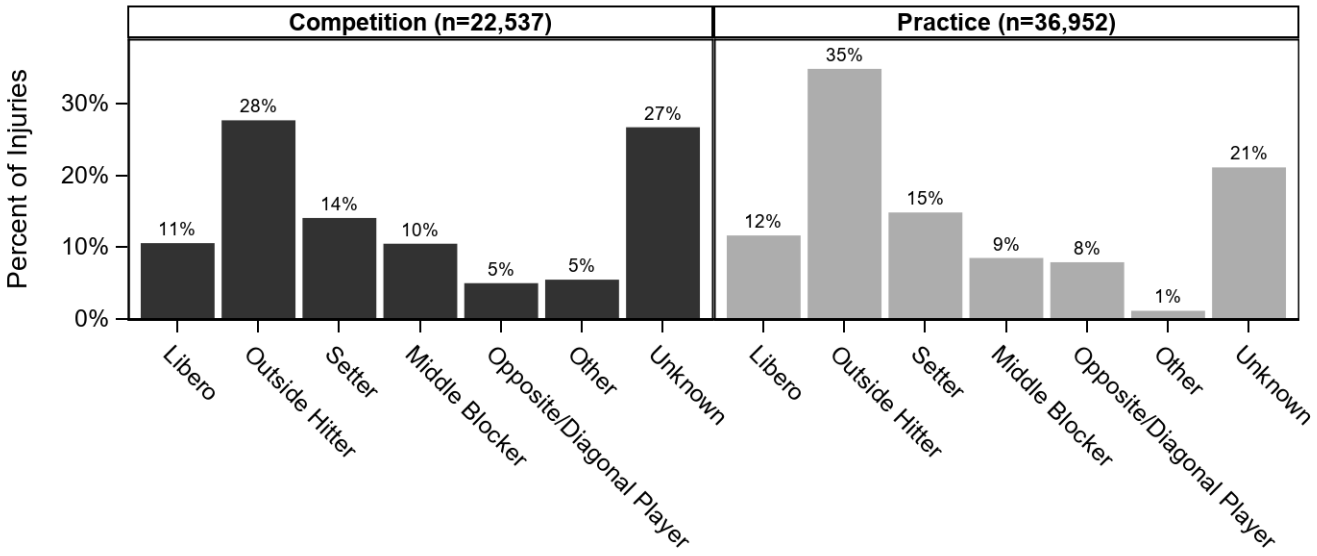


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**Table 6.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| General Play | 5,231 | 23.2% | 13,833 | 37.4% | 19,064 | 32.0% |
| Blocking | 3,332 | 14.8% | 7,203 | 19.5% | 10,536 | 17.7% |
| Digging | 4,356 | 19.3% | 2,005 | 5.4% | 6,361 | 10.7% |
| Unknown | 984 | 4.4% | 4,572 | 12.4% | 5,556 | 9.3% |
| Spiking | 3,000 | 13.3% | 1,891 | 5.1% | 4,891 | 8.2% |
| Other | 2,549 | 11.3% | 815 | 2.2% | 3,364 | 5.7% |
| Setting | 1,347 | 6.0% | 1,944 | 5.3% | 3,291 | 5.5% |
| Passing | 1,524 | 6.8% | 1,610 | 4.4% | 3,134 | 5.3% |
| Serving | 213 | 0.9% | 1,452 | 3.9% | 1,665 | 2.8% |
| Conditioning | 0 | 0.0% | 1,627 | 4.4% | 1,627 | 2.7% |
| ***Total*** | ***22,537*** | ***100.0%*** | ***36,952*** | ***100.0%*** | ***59,488*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 6.10 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Blocking | 9,313 | 27.3% | 0 | 0.0% | 126 | 6.6% | 0 | 0.0% | 1,097 | 7.7% |
| Conditioning | 1,203 | 3.5% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 423 | 3.0% |
| Digging | 3,612 | 10.6% | 0 | 0.0% | 0 | 0.0% | 2,749 | 32.3% | 0 | 0.0% |
| General Play | 6,946 | 20.3% | 653 | 100.0% | 1,022 | 53.4% | 1,888 | 22.2% | 8,555 | 60.1% |
| Other | 815 | 2.4% | 0 | 0.0% | 213 | 11.2% | 1,737 | 20.4% | 599 | 4.2% |
| Passing | 2,594 | 7.6% | 0 | 0.0% | 213 | 11.2% | 327 | 3.8% | 0 | 0.0% |
| Serving | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 850 | 10.0% | 815 | 5.7% |
| Setting | 2,646 | 7.7% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 645 | 4.5% |
| Spiking | 3,962 | 11.6% | 0 | 0.0% | 0 | 0.0% | 327 | 3.8% | 602 | 4.2% |
| Unknown | 3,069 | 9.0% | 0 | 0.0% | 339 | 17.7% | 645 | 7.6% | 1,503 | 10.6% |
| ***Total*** | ***34,162*** | ***100.0%*** | ***653*** | ***100.0%*** | ***1,913*** | ***100.0%*** | ***8,522*** | ***100.0%*** | ***14,238*** | ***100.0%*** |

* Totals and n's represent the total 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.

# VII. Boys' Basketball Injury Epidemiology

**Table 7.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***281*** | ***177,261*** | ***1.59*** | ***102,434*** |
| Competition | 147 | 56,508 | 2.60 | 54,994 |
| Practice | 134 | 120,753 | 1.11 | 47,440 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 7.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 20,719 | 20.9% |
| Sophomore | 24,541 | 24.7% |
| Junior | 29,551 | 29.8% |
| Senior | 24,433 | 24.6% |
| ***Total*** | ***99,243*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 14 |
| Maximum | 18 |
| Mean (SD) | 16.0 (1.1) |
| n | 85,832 |

| BMI | |
|---|---|
| Minimum | 16.4 |
| Maximum | 40.3 |
| Mean (SD) | 23.3 (3.7) |
| n | 58,514 |

* Throughout this chapter, totals and n's represent the total 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 Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

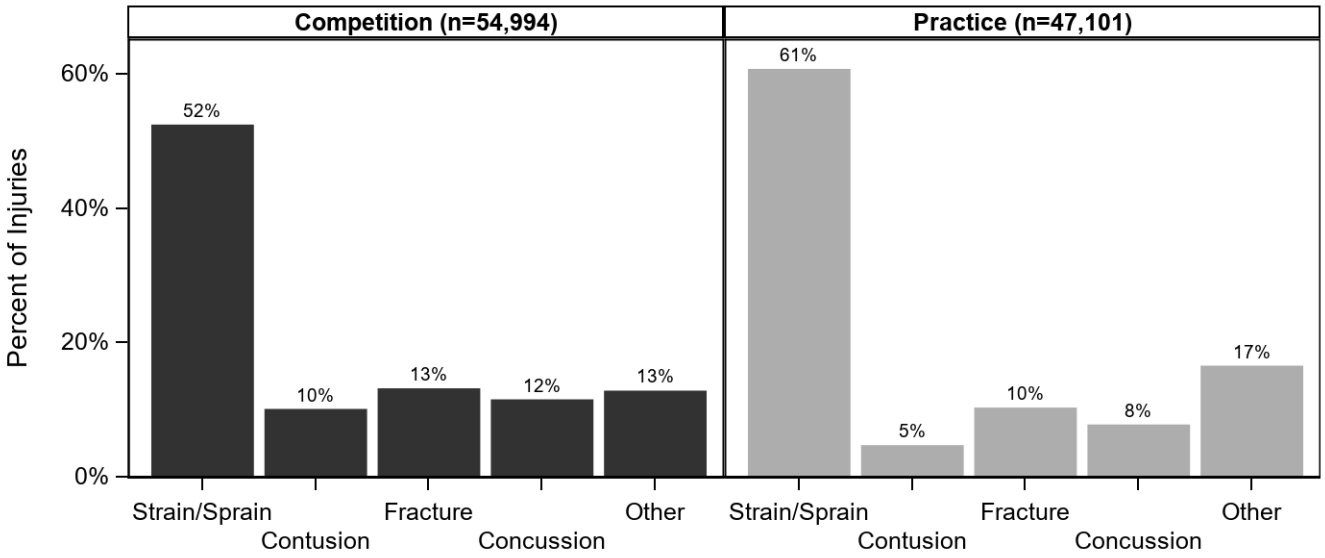



**Table 7.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle | 22,082 | 40.2% | 16,591 | 35.0% | 38,673 | 37.8% |
| Head/Face | 11,237 | 20.4% | 5,561 | 11.7% | 16,798 | 16.4% |
| Hand/Wrist | 6,087 | 11.1% | 2,990 | 6.3% | 9,077 | 8.9% |
| Knee | 3,296 | 6.0% | 5,764 | 12.2% | 9,060 | 8.8% |
| Hip/Thigh/Upper Leg | 3,491 | 6.3% | 5,225 | 11.0% | 8,715 | 8.5% |
| Trunk | 1,946 | 3.5% | 3,721 | 7.8% | 5,667 | 5.5% |
| Foot | 1,384 | 2.5% | 2,899 | 6.1% | 4,283 | 4.2% |
| Lower Leg | 1,465 | 2.7% | 2,277 | 4.8% | 3,742 | 3.7% |
| Shoulder | 2,312 | 4.2% | 819 | 1.7% | 3,131 | 3.1% |
| Systemic | 1,120 | 2.0% | 728 | 1.5% | 1,847 | 1.8% |
| Arm/Elbow | 574 | 1.0% | 527 | 1.1% | 1,101 | 1.1% |
| Neck | 0 | 0.0% | 339 | 0.7% | 339 | 0.3% |
| ***Total*** | ***54,994*** | ***100.0%*** | ***47,440*** | ***100.0%*** | ***102,434*** | ***100.0%*** |

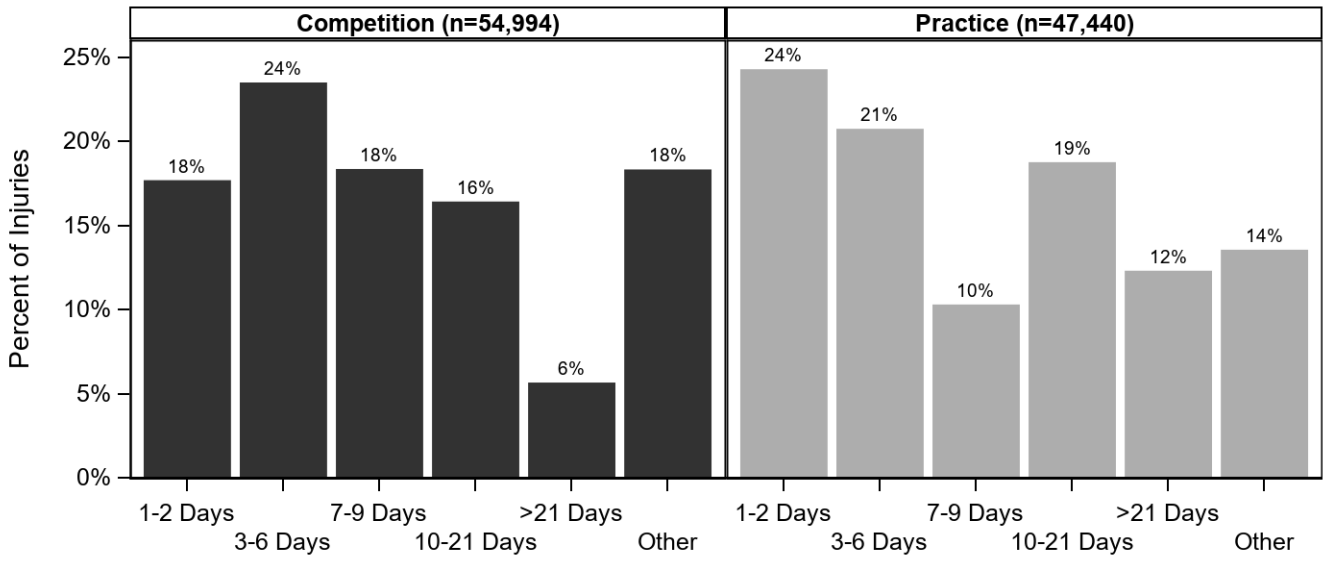
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 7.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=54,993) | | Practice (n=47,103) | | Overall (n=102,095) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle Strain/Sprain | 18,921 | 34.4% | 16,403 | 34.8% | 35,325 | 34.6% |
| Head/Face Concussion | 6,334 | 11.5% | 3,662 | 7.8% | 9,996 | 9.8% |
| Hip/Thigh/Upper Leg Strain/Sprain | 1,657 | 3.0% | 4,040 | 8.6% | 5,696 | 5.6% |
| Hand/Wrist Strain/Sprain | 3,890 | 7.1% | 527 | 1.1% | 4,417 | 4.3% |
| Knee Strain/Sprain | 1,582 | 2.9% | 1,899 | 4.0% | 3,480 | 3.4% |
| Knee Other | 565 | 1.0% | 2,848 | 6.0% | 3,413 | 3.3% |
| Hand/Wrist Fracture | 1,857 | 3.4% | 1,527 | 3.2% | 3,384 | 3.3% |
| Head/Face Other | 2,512 | 4.6% | 679 | 1.4% | 3,190 | 3.1% |
| Ankle Fracture | 2,586 | 4.7% | 188 | 0.4% | 2,774 | 2.7% |
| Trunk Strain/Sprain | 633 | 1.2% | 2,016 | 4.3% | 2,649 | 2.6% |

* Totals and n's represent the total 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 7.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Boys' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 5,675 | 10.4% | 3,212 | 7.0% | 8,887 | 8.8% |
| Did Not Require Surgery | 49,131 | 89.6% | 42,893 | 93.0% | 92,024 | 91.2% |
| ***Total*** | ***54,806*** | ***100.0%*** | ***46,104*** | ***100.0%*** | ***100,911*** | ***100.0%*** |

* Totals and n's represent the total 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 7.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

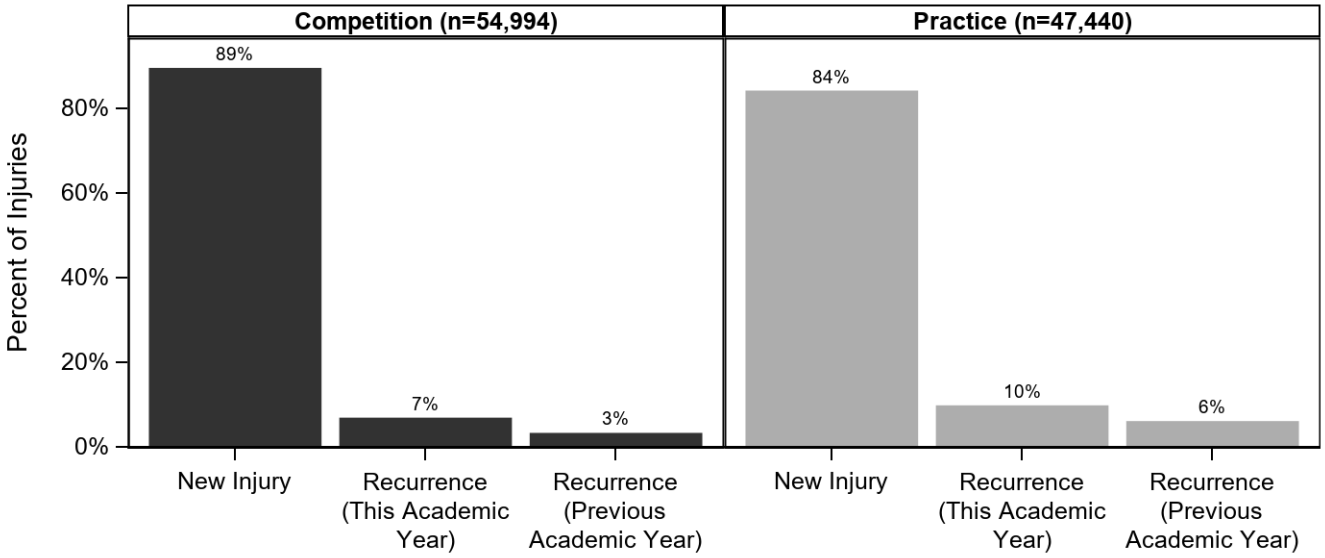



**Table 7.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 20,330 | 19.8% |
| Regular Season | 75,684 | 73.9% |
| Post Season | 3,292 | 3.2% |
| Unknown/Other | 3,127 | 3.1% |
| ***Total*** | ***102,434*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 7.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 637 | 1.2% |
| First Quarter | 5,779 | 10.9% |
| Second Quarter | 12,190 | 23.1% |
| Third Quarter | 10,048 | 19.0% |
| Fourth Quarter | 11,285 | 21.4% |
| Unknown | 12,852 | 24.3% |
| ***Total*** | ***52,792*** | ***100.0%*** |

| Court Location | | |
|---|---|---|
| Inside Lane (Offense) | 9,271 | 17.6% |
| Inside Lane (Defense) | 9,592 | 18.2% |
| Between 3 Point Arc and Lane (Offense) | 2,022 | 3.8% |
| Between 3 Point Arc and Lane (Defense) | 4,632 | 8.8% |
| Outside 3 Point Arc (Offense) | 1,882 | 3.6% |
| Outside 3 Point Arc (Defense) | 2,662 | 5.0% |
| Out of Bounds | 690 | 1.3% |
| Off the Court | 1,131 | 2.1% |
| Backcourt | 1,795 | 3.4% |
| Unknown | 19,115 | 36.2% |
| ***Total*** | ***52,792*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 7.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 6,112 | 13.1% |
| Second 1/2 Hour | 7,694 | 16.5% |
| 1-2 Hours into Practice | 21,579 | 46.3% |
| >2 Hours into Practice | 1,809 | 3.9% |
| Unknown | 9,411 | 20.2% |
| ***Total*** | ***46,605*** | ***100.0%*** |

* Totals and n's represent the total 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 7.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

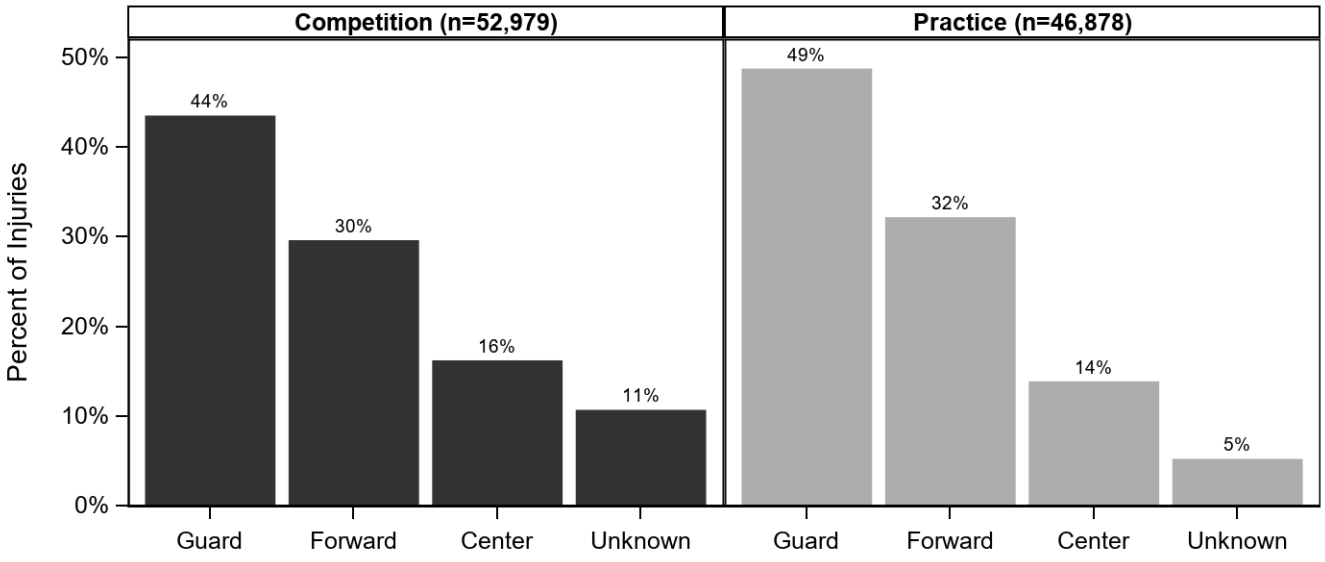


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**Table 7.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Rebounding | 15,214 | 28.7% | 6,492 | 13.7% | 21,707 | 21.6% |
| Unknown | 9,581 | 18.1% | 8,652 | 18.2% | 18,233 | 18.2% |
| General Play | 6,105 | 11.5% | 11,418 | 24.1% | 17,523 | 17.4% |
| Defending | 9,381 | 17.7% | 5,295 | 11.2% | 14,676 | 14.6% |
| Shooting | 3,923 | 7.4% | 4,615 | 9.7% | 8,538 | 8.5% |
| Chasing Loose Ball | 3,578 | 6.8% | 1,789 | 3.8% | 5,367 | 5.3% |
| Conditioning | 0 | 0.0% | 4,210 | 8.9% | 4,210 | 4.2% |
| Ball Handling/Dribbling | 2,513 | 4.7% | 1,198 | 2.5% | 3,711 | 3.7% |
| Other | 1,120 | 2.1% | 1,694 | 3.6% | 2,814 | 2.8% |
| Receiving Pass | 1,011 | 1.9% | 984 | 2.1% | 1,994 | 2.0% |
| Screening | 554 | 1.0% | 339 | 0.7% | 894 | 0.9% |
| Passing | 0 | 0.0% | 753 | 1.6% | 753 | 0.7% |
| ***Total*** | ***52,979*** | ***100.0%*** | ***47,440*** | ***100.0%*** | ***100,420*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 7.10 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ball Handling/Dribbling | 1,592 | 2.8% | 1,109 | 15.7% | 0 | 0.0% | 565 | 5.7% | 445 | 3.1% |
| Chasing Loose Ball | 1,920 | 3.4% | 565 | 8.0% | 1,298 | 10.7% | 339 | 3.4% | 1,244 | 8.6% |
| Conditioning | 2,185 | 3.9% | 339 | 4.8% | 565 | 4.7% | 0 | 0.0% | 1,120 | 7.8% |
| Defending | 8,606 | 15.2% | 807 | 11.4% | 854 | 7.1% | 1,418 | 14.2% | 2,652 | 18.4% |
| General Play | 10,427 | 18.4% | 923 | 13.0% | 1,676 | 13.9% | 1,441 | 14.4% | 3,056 | 21.2% |
| Other | 1,683 | 3.0% | 0 | 0.0% | 0 | 0.0% | 565 | 5.7% | 565 | 3.9% |
| Passing | 565 | 1.0% | 0 | 0.0% | 0 | 0.0% | 188 | 1.9% | 0 | 0.0% |
| Rebounding | 13,551 | 24.0% | 949 | 13.4% | 3,238 | 26.8% | 1,488 | 14.9% | 2,481 | 17.2% |
| Receiving Pass | 657 | 1.2% | 0 | 0.0% | 445 | 3.7% | 0 | 0.0% | 892 | 6.2% |
| Screening | 0 | 0.0% | 0 | 0.0% | 554 | 4.6% | 339 | 3.4% | 0 | 0.0% |
| Shooting | 6,009 | 10.6% | 677 | 9.6% | 1,421 | 11.8% | 188 | 1.9% | 244 | 1.7% |
| Unknown | 9,332 | 16.5% | 1,714 | 24.2% | 2,033 | 16.8% | 3,465 | 34.7% | 1,689 | 11.7% |
| ***Total*** | ***56,527*** | ***100.0%*** | ***7,083*** | ***100.0%*** | ***12,085*** | ***100.0%*** | ***9,996*** | ***100.0%*** | ***14,390*** | ***100.0%*** |

* Totals and n's represent the total 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.

# VIII. Girls' Basketball Injury Epidemiology

**Table 8.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***272*** | ***115,351*** | ***2.36*** | ***96,585*** |
| Competition | 191 | 37,157 | 5.14 | 68,747 |
| Practice | 81 | 78,194 | 1.04 | 27,838 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 8.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 28,125 | 30.0% |
| Sophomore | 21,985 | 23.4% |
| Junior | 20,345 | 21.7% |
| Senior | 23,409 | 24.9% |
| ***Total*** | ***93,864*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 15.8 (1.2) |
| n | 80,205 |

| BMI | |
|---|---|
| Minimum | 17.2 |
| Maximum | 36.0 |
| Mean (SD) | 22.3 (3.3) |
| n | 57,332 |

* Throughout this chapter, totals and n's represent the total 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 Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

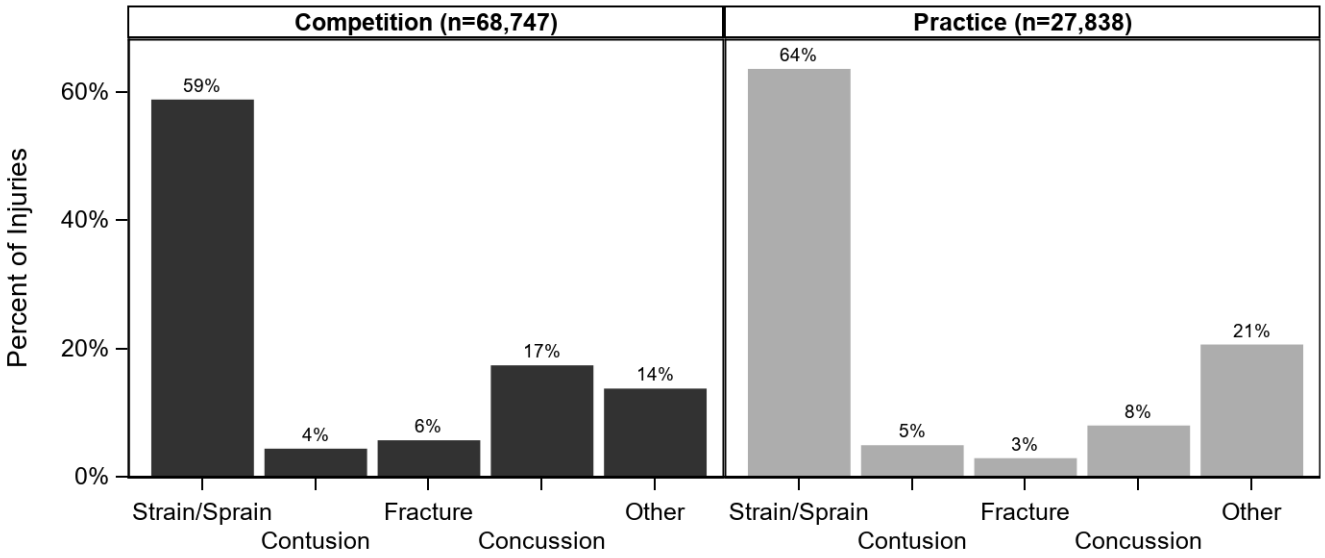



**Table 8.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle | 26,261 | 38.2% | 8,118 | 29.2% | 34,379 | 35.6% |
| Knee | 14,579 | 21.2% | 3,331 | 12.0% | 17,910 | 18.5% |
| Head/Face | 13,411 | 19.5% | 3,130 | 11.2% | 16,540 | 17.1% |
| Hand/Wrist | 5,883 | 8.6% | 2,709 | 9.7% | 8,592 | 8.9% |
| Lower Leg | 1,949 | 2.8% | 2,736 | 9.8% | 4,685 | 4.9% |
| Foot | 1,496 | 2.2% | 2,615 | 9.4% | 4,111 | 4.3% |
| Shoulder | 1,495 | 2.2% | 1,894 | 6.8% | 3,389 | 3.5% |
| Hip/Thigh/Upper Leg | 1,168 | 1.7% | 1,391 | 5.0% | 2,559 | 2.6% |
| Arm/Elbow | 1,158 | 1.7% | 537 | 1.9% | 1,695 | 1.8% |
| Trunk | 440 | 0.6% | 1,098 | 3.9% | 1,538 | 1.6% |
| Systemic | 554 | 0.8% | 279 | 1.0% | 833 | 0.9% |
| Neck | 352 | 0.5% | 0 | 0.0% | 352 | 0.4% |
| ***Total*** | ***68,747*** | ***100.0%*** | ***27,838*** | ***100.0%*** | ***96,585*** | ***100.0%*** |

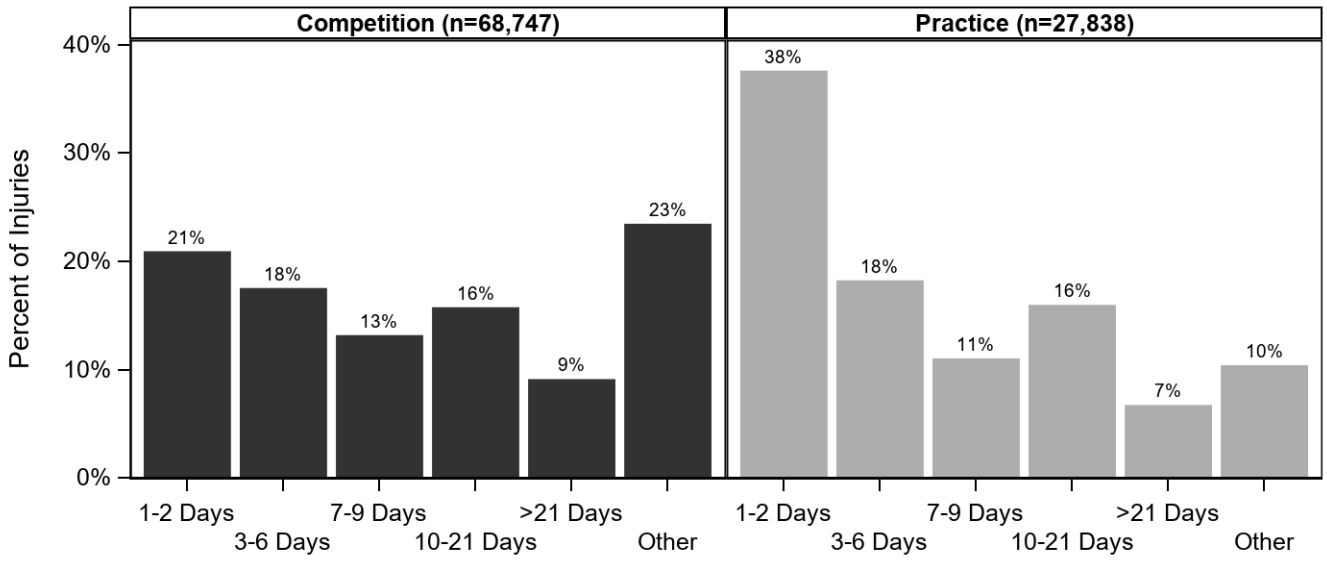
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 8.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=68,745) | | Practice (n=27,836) | | Overall (n=96,583) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ankle Strain/Sprain | 25,456 | 37.0% | 8,118 | 29.2% | 33,574 | 34.8% |
| Head/Face Concussion | 11,942 | 17.4% | 2,223 | 8.0% | 14,165 | 14.7% |
| Knee Strain/Sprain | 8,213 | 11.9% | 1,286 | 4.6% | 9,499 | 9.8% |
| Knee Other | 4,577 | 6.7% | 2,045 | 7.3% | 6,622 | 6.9% |
| Hand/Wrist Strain/Sprain | 4,598 | 6.7% | 1,980 | 7.1% | 6,578 | 6.8% |
| Foot Strain/Sprain | 614 | 0.9% | 2,528 | 9.1% | 3,141 | 3.3% |
| Shoulder Other | 1,303 | 1.9% | 1,615 | 5.8% | 2,919 | 3.0% |
| Lower Leg Strain/Sprain | 554 | 0.8% | 1,568 | 5.6% | 2,122 | 2.2% |
| Lower Leg Other | 642 | 0.9% | 1,168 | 4.2% | 1,810 | 1.9% |
| Hip/Thigh/Upper Leg Strain/Sprain | 268 | 0.4% | 1,391 | 5.0% | 1,660 | 1.7% |

* Totals and n's represent the total 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 8.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Girls' Basketball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 6,764 | 10.0% | 1,726 | 6.3% | 8,490 | 8.9% |
| Did Not Require Surgery | 60,895 | 90.0% | 25,498 | 93.7% | 86,393 | 91.1% |
| ***Total*** | ***67,659*** | ***100.0%*** | ***27,224*** | ***100.0%*** | ***94,883*** | ***100.0%*** |

* Totals and n's represent the total 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 8.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

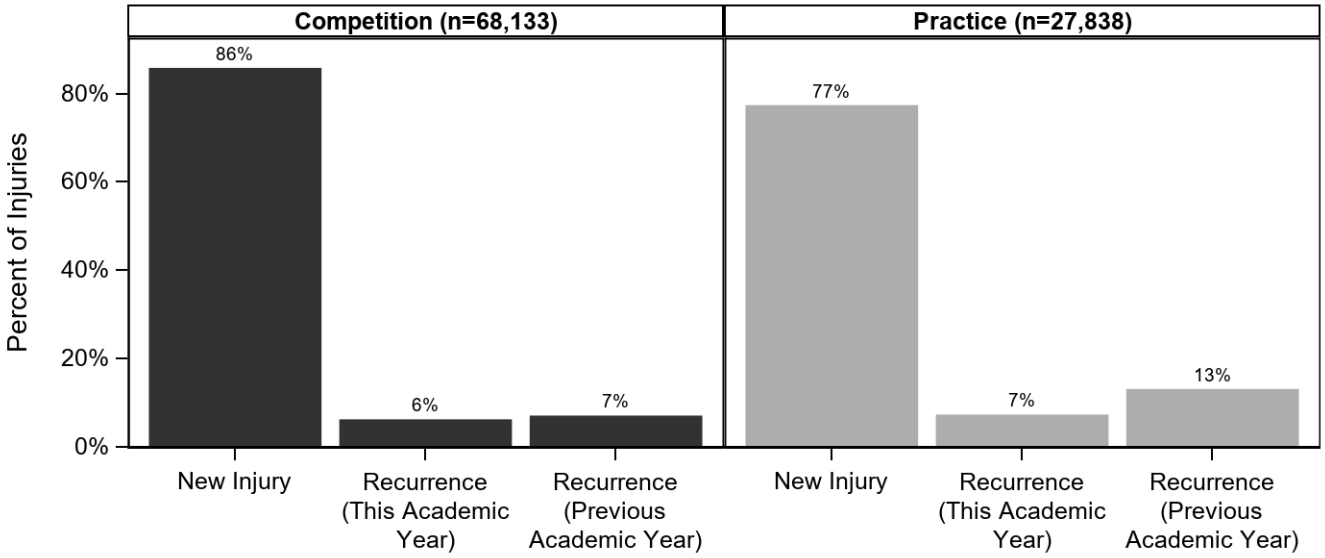



**Table 8.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 14,531 | 15.0% |
| Regular Season | 77,841 | 80.6% |
| Post Season | 3,619 | 3.7% |
| Unknown/Other | 595 | 0.6% |
| ***Total*** | ***96,585*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 8.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 440 | 0.7% |
| First Quarter | 4,779 | 7.3% |
| Second Quarter | 16,137 | 24.7% |
| Third Quarter | 14,413 | 22.1% |
| Fourth Quarter | 15,044 | 23.1% |
| Unknown | 14,431 | 22.1% |
| ***Total*** | ***65,244*** | ***100.0%*** |

| Court Location | | |
|---|---|---|
| Inside Lane (Offense) | 10,356 | 16.3% |
| Inside Lane (Defense) | 11,531 | 18.1% |
| Between 3 Point Arc and Lane (Offense) | 4,864 | 7.6% |
| Between 3 Point Arc and Lane (Defense) | 6,468 | 10.2% |
| Outside 3 Point Arc (Offense) | 2,678 | 4.2% |
| Outside 3 Point Arc (Defense) | 1,102 | 1.7% |
| Out of Bounds | 1,175 | 1.8% |
| Backcourt | 2,119 | 3.3% |
| Unknown | 23,421 | 36.8% |
| ***Total*** | ***63,716*** | ***100.0%*** |

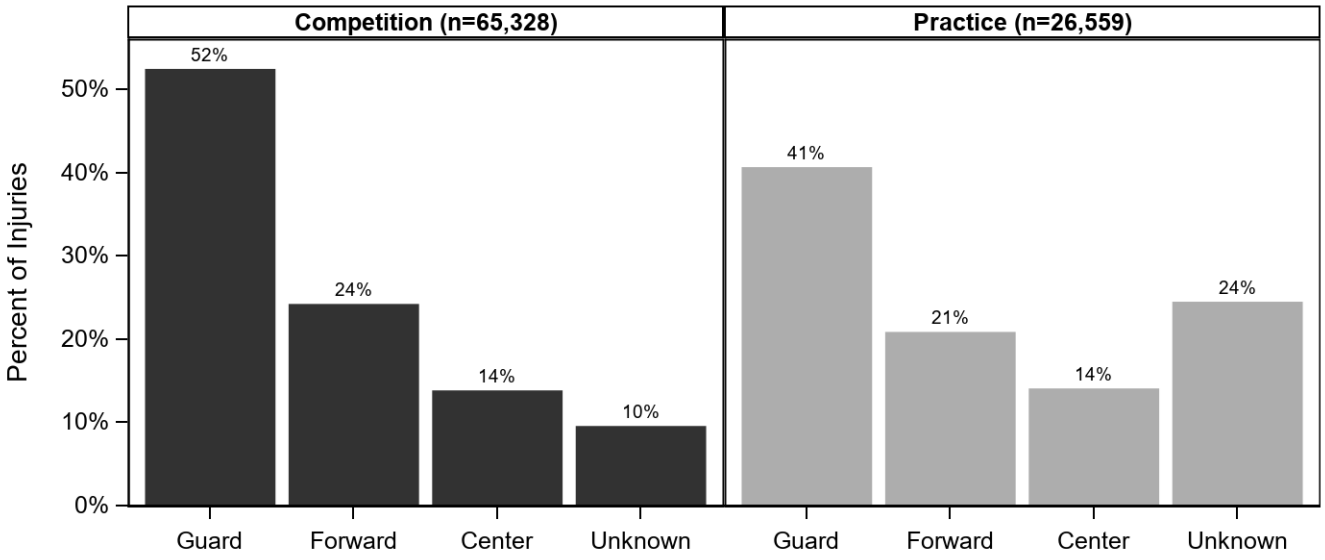
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 8.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 1,823 | 6.6% |
| Second 1/2 Hour | 3,577 | 13.0% |
| 1-2 Hours into Practice | 13,720 | 49.9% |
| >2 Hours into Practice | 786 | 2.9% |
| Unknown | 7,580 | 27.6% |
| ***Total*** | ***27,486*** | ***100.0%*** |

* Totals and n's represent the total 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 8.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**



REPORTING INFORMATION ONLINE

**Table 8.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Rebounding | 11,645 | 17.8% | 5,727 | 21.6% | 17,372 | 18.9% |
| General Play | 10,417 | 15.9% | 6,753 | 25.4% | 17,170 | 18.6% |
| Defending | 13,473 | 20.6% | 3,170 | 11.9% | 16,642 | 18.1% |
| Unknown | 8,534 | 13.0% | 5,964 | 22.5% | 14,498 | 15.7% |
| Chasing Loose Ball | 8,088 | 12.3% | 631 | 2.4% | 8,720 | 9.5% |
| Ball Handling/Dribbling | 5,208 | 7.9% | 735 | 2.8% | 5,943 | 6.5% |
| Shooting | 3,666 | 5.6% | 997 | 3.8% | 4,663 | 5.1% |
| Receiving Pass | 3,120 | 4.8% | 1,397 | 5.3% | 4,517 | 4.9% |
| Other | 1,384 | 2.1% | 88 | 0.3% | 1,472 | 1.6% |
| Conditioning | 0 | 0.0% | 1,098 | 4.1% | 1,098 | 1.2% |
| ***Total*** | ***65,536*** | ***100.0%*** | ***26,559*** | ***100.0%*** | ***92,096*** | ***100.0%*** |

* Totals and n's represent the total 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.

REPORTING INFORMATION ONLINE

**Table 8.10 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Ball Handling/Dribbling | 5,215 | 9.5% | 0 | 0.0% | 0 | 0.0% | 460 | 3.5% | 268 | 1.8% |
| Chasing Loose Ball | 1,779 | 3.2% | 0 | 0.0% | 268 | 5.7% | 4,943 | 37.8% | 1,729 | 11.5% |
| Conditioning | 907 | 1.7% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 191 | 1.3% |
| Defending | 8,291 | 15.1% | 1,058 | 24.2% | 1,488 | 31.6% | 3,317 | 25.4% | 2,489 | 16.6% |
| General Play | 11,455 | 20.9% | 705 | 16.1% | 970 | 20.6% | 537 | 4.1% | 3,503 | 23.4% |
| Other | 742 | 1.4% | 0 | 0.0% | 0 | 0.0% | 88 | 0.7% | 642 | 4.3% |
| Rebounding | 10,854 | 19.8% | 966 | 22.1% | 544 | 11.5% | 2,231 | 17.1% | 2,776 | 18.5% |
| Receiving Pass | 3,687 | 6.7% | 0 | 0.0% | 742 | 15.7% | 0 | 0.0% | 88 | 0.6% |
| Shooting | 2,947 | 5.4% | 621 | 14.2% | 0 | 0.0% | 0 | 0.0% | 1,095 | 7.3% |
| Unknown | 9,055 | 16.5% | 1,024 | 23.4% | 702 | 14.9% | 1,502 | 11.5% | 2,216 | 14.8% |
| ***Total*** | ***54,933*** | ***100.0%*** | ***4,374*** | ***100.0%*** | ***4,714*** | ***100.0%*** | ***13,078*** | ***100.0%*** | ***14,998*** | ***100.0%*** |

* Totals and n's represent the total 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.

# IX. Boys' Wrestling Injury Epidemiology

**Table 9.1 Boys' Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***374*** | ***150,832*** | ***2.48*** | ***128,822*** |
| Competition | 167 | 39,231 | 4.26 | 62,263 |
| Practice | 207 | 111,601 | 1.85 | 66,559 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 9.2 Demographic Characteristics of Injured Boys' Wrestling Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 33,937 | 26.6% |
| Sophomore | 38,843 | 30.4% |
| Junior | 27,759 | 21.7% |
| Senior | 27,238 | 21.3% |
| ***Total*** | ***127,777*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 19 |
| Mean (SD) | 15.8 (1.2) |
| n | 105,719 |

| BMI | |
|---|---|
| Minimum | 16.5 |
| Maximum | 41.0 |
| Mean (SD) | 24.4 (4.5) |
| n | 75,694 |

* Throughout this chapter, totals and n's represent the total 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 Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

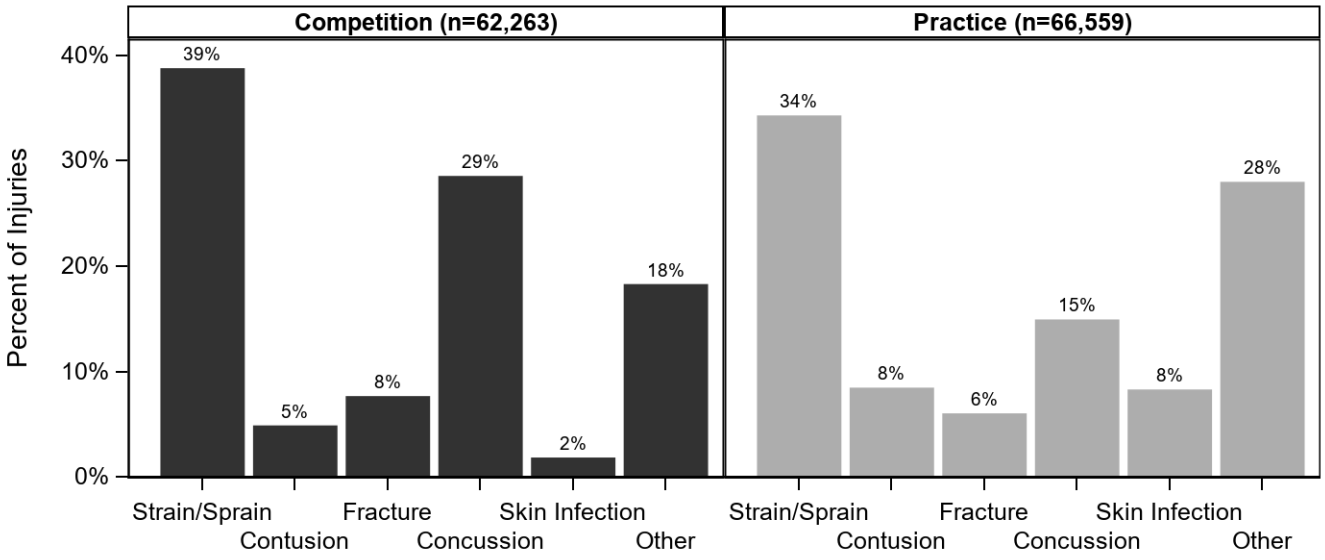



**Table 9.3 Body Site of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face | 20,681 | 33.2% | 13,907 | 20.9% | 34,587 | 26.8% |
| Knee | 9,161 | 14.7% | 12,541 | 18.8% | 21,702 | 16.8% |
| Shoulder | 7,349 | 11.8% | 7,520 | 11.3% | 14,869 | 11.5% |
| Ankle | 5,437 | 8.7% | 5,466 | 8.2% | 10,903 | 8.5% |
| Trunk | 4,408 | 7.1% | 4,950 | 7.4% | 9,358 | 7.3% |
| Hand/Wrist | 3,877 | 6.2% | 5,202 | 7.8% | 9,080 | 7.0% |
| Arm/Elbow | 4,431 | 7.1% | 4,177 | 6.3% | 8,608 | 6.7% |
| Lower Leg | 2,412 | 3.9% | 2,558 | 3.8% | 4,970 | 3.9% |
| Neck | 1,651 | 2.7% | 2,527 | 3.8% | 4,178 | 3.2% |
| Other | 2,005 | 3.2% | 943 | 1.4% | 2,949 | 2.3% |
| Foot | 461 | 0.7% | 2,467 | 3.7% | 2,928 | 2.3% |
| Systemic | 0 | 0.0% | 2,460 | 3.7% | 2,460 | 1.9% |
| Hip/Thigh/Upper Leg | 389 | 0.6% | 1,842 | 2.8% | 2,231 | 1.7% |
| ***Total*** | ***62,263*** | ***100.0%*** | ***66,559*** | ***100.0%*** | ***128,822*** | ***100.0%*** |

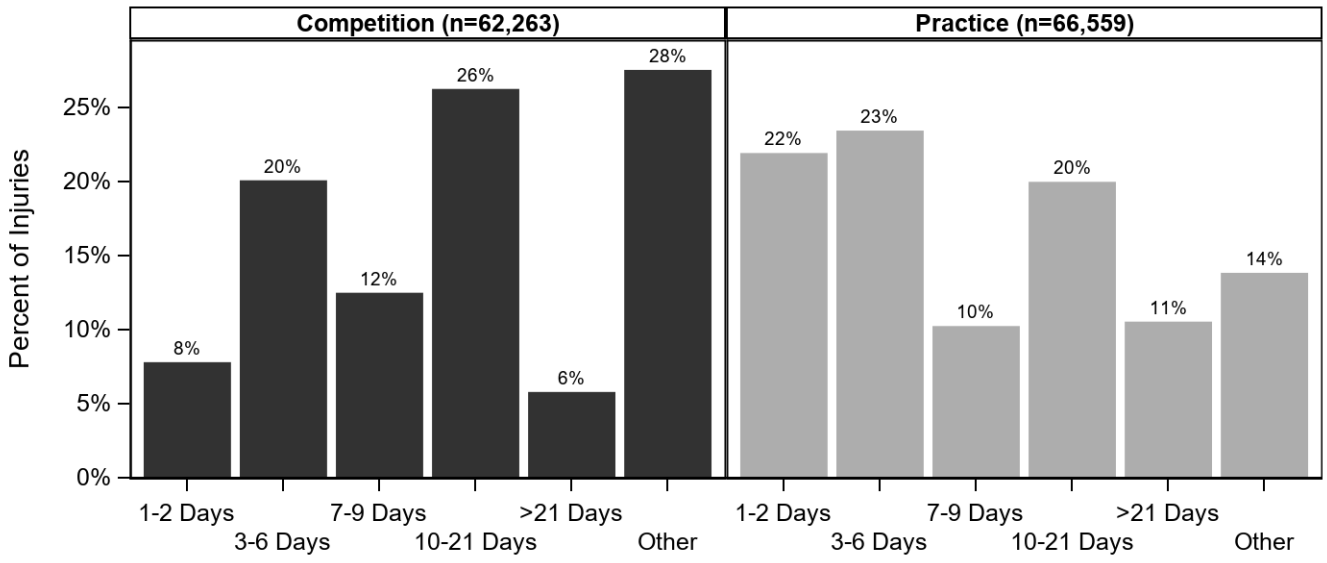
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 9.4 Ten Most Common Boys' Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=62,265) | | Practice (n=66,558) | | Overall (n=128,821) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face Concussion | 17,783 | 28.6% | 9,939 | 14.9% | 27,721 | 21.5% |
| Ankle Strain/Sprain | 5,069 | 8.1% | 5,466 | 8.2% | 10,534 | 8.2% |
| Knee Strain/Sprain | 5,753 | 9.2% | 4,327 | 6.5% | 10,080 | 7.8% |
| Knee Other | 3,408 | 5.5% | 6,358 | 9.6% | 9,765 | 7.6% |
| Shoulder Other | 3,865 | 6.2% | 4,652 | 7.0% | 8,518 | 6.6% |
| Shoulder Strain/Sprain | 3,483 | 5.6% | 2,684 | 4.0% | 6,167 | 4.8% |
| Trunk Strain/Sprain | 2,604 | 4.2% | 2,856 | 4.3% | 5,460 | 4.2% |
| Head/Face Other | 1,374 | 2.2% | 3,209 | 4.8% | 4,582 | 3.6% |
| Arm/Elbow Other | 1,478 | 2.4% | 2,282 | 3.4% | 3,760 | 2.9% |
| Hand/Wrist Strain/Sprain | 1,883 | 3.0% | 1,607 | 2.4% | 3,490 | 2.7% |

* Totals and n's represent the total 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 9.2 Time Loss of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Boys' Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 4,770 | 7.9% | 3,230 | 4.9% | 7,999 | 6.3% |
| Did Not Require Surgery | 55,933 | 92.1% | 62,941 | 95.1% | 118,874 | 93.7% |
| ***Total*** | ***60,702*** | ***100.0%*** | ***66,170*** | ***100.0%*** | ***126,873*** | ***100.0%*** |

* Totals and n's represent the total 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 9.3 History of Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

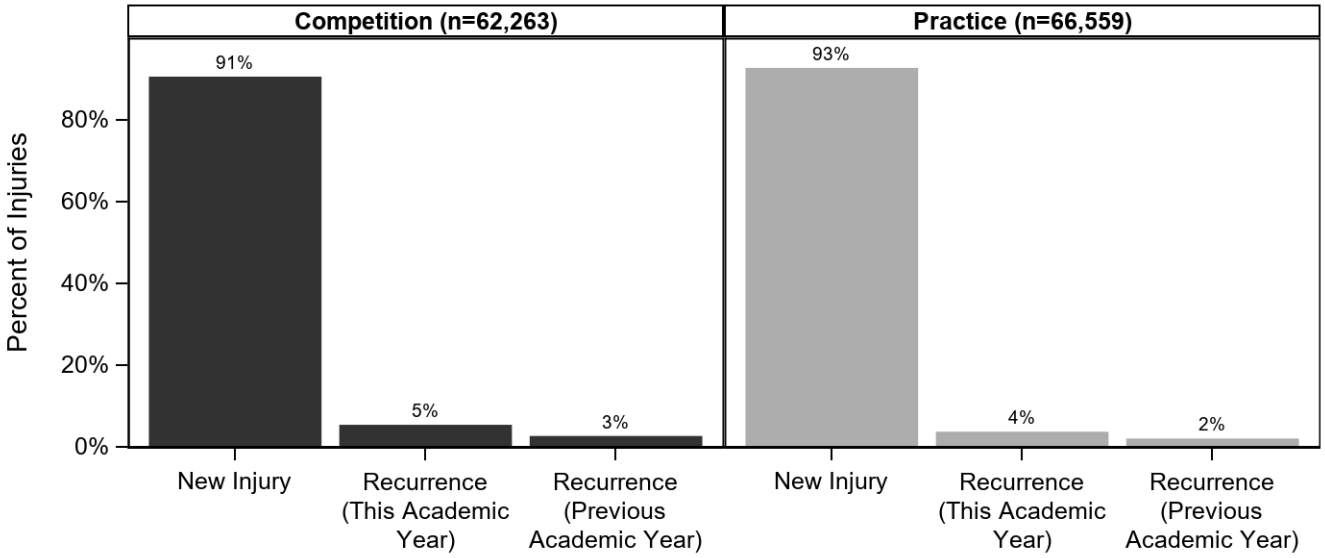



**Table 9.6 Time during Season of Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 20,476 | 15.9% |
| Regular Season | 97,404 | 75.8% |
| Post Season | 8,168 | 6.4% |
| Unknown/Other | 2,461 | 1.9% |
| ***Total*** | ***128,508*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 9.7 Competition-Related Variables for Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 1,229 | 2.1% |
| First Period | 4,824 | 8.2% |
| Second Period | 13,342 | 22.7% |
| Third Period | 10,500 | 17.8% |
| Unknown | 28,957 | 49.2% |
| ***Total*** | ***58,853*** | ***100.0%*** |

| Mat Location | | |
|---|---|---|
| Within 28ft Circle | 44,962 | 74.3% |
| Out of Bounds | 1,070 | 1.8% |
| Off Mat | 916 | 1.5% |
| Unknown | 13,542 | 22.4% |
| ***Total*** | ***60,490*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 9.8 Practice-Related Variables for Boys' Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 7,333 | 11.2% |
| Second 1/2 Hour | 4,862 | 7.4% |
| 1-2 Hours into Practice | 33,596 | 51.5% |
| >2 Hours into Practice | 2,247 | 3.4% |
| Unknown | 17,255 | 26.4% |
| ***Total*** | ***65,292*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 9.9 Activities Leading to Boys' Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Takedown | 26,757 | 43.8% | 18,530 | 28.9% | 45,287 | 36.2% |
| Unknown | 16,372 | 26.8% | 15,697 | 24.5% | 32,069 | 25.6% |
| Sparring | 4,597 | 7.5% | 9,518 | 14.8% | 14,115 | 11.3% |
| N/A ** | 684 | 1.1% | 7,419 | 11.6% | 8,103 | 6.5% |
| Conditioning | 0 | 0.0% | 5,925 | 9.2% | 5,925 | 4.7% |
| Other | 2,358 | 3.9% | 3,155 | 4.9% | 5,513 | 4.4% |
| Fall | 2,776 | 4.5% | 1,197 | 1.9% | 3,973 | 3.2% |
| Near Fall | 3,127 | 5.1% | 492 | 0.8% | 3,619 | 2.9% |
| Escape | 2,197 | 3.6% | 1,353 | 2.1% | 3,550 | 2.8% |
| Riding | 1,623 | 2.7% | 498 | 0.8% | 2,121 | 1.7% |
| Reversal | 609 | 1.0% | 314 | 0.5% | 922 | 0.7% |
| ***Total*** | ***61,098*** | ***100.0%*** | ***64,098*** | ***100.0%*** | ***125,196*** | ***100.0%*** |

* Totals and n's represent the total 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.
** Includes overuse, heat illness, conditioning, etc.

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**Table 9.10 Activity Resulting in Boys' Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/ Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Conditioning | 2,390 | 5.2% | 0 | 0.0% | 75 | 0.9% | 0 | 0.0% | 3,460 | 10.1% |
| Escape | 3,181 | 6.9% | 184 | 2.1% | 0 | 0.0% | 0 | 0.0% | 184 | 0.5% |
| Fall | 915 | 2.0% | 492 | 5.7% | 554 | 6.4% | 916 | 3.3% | 1,096 | 3.2% |
| N/A ** | 184 | 0.4% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 7,919 | 23.1% |
| Near Fall | 1,289 | 2.8% | 0 | 0.0% | 0 | 0.0% | 1,101 | 4.0% | 1,229 | 3.6% |
| Other | 1,261 | 2.7% | 609 | 7.1% | 676 | 7.8% | 1,060 | 3.8% | 1,907 | 5.6% |
| Reversal | 609 | 1.3% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 314 | 0.9% |
| Riding | 737 | 1.6% | 0 | 0.0% | 184 | 2.1% | 609 | 2.2% | 591 | 1.7% |
| Sparring | 5,985 | 13.0% | 718 | 8.4% | 498 | 5.7% | 3,518 | 12.7% | 3,396 | 9.9% |
| Takedown | 17,953 | 39.0% | 4,285 | 49.9% | 4,058 | 46.7% | 11,950 | 43.2% | 7,042 | 20.6% |
| Unknown | 11,540 | 25.1% | 2,302 | 26.8% | 2,651 | 30.5% | 8,493 | 30.7% | 7,082 | 20.7% |
| ***Total*** | ***46,045*** | ***100.0%*** | ***8,590*** | ***100.0%*** | ***8,697*** | ***100.0%*** | ***27,646*** | ***100.0%*** | ***34,219*** | ***100.0%*** |

* Totals and n's represent the total 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.
** Includes overuse, heat illness, conditioning, etc.

# X. Boys' Baseball Injury Epidemiology

**Table 10.1 Boys' Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***160*** | ***151,183*** | ***1.06*** | ***74,776*** |
| Competition | 96 | 52,038 | 1.84 | 43,526 |
| Practice | 64 | 99,145 | 0.65 | 31,250 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 10.2 Demographic Characteristics of Injured Boys' Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 14,185 | 19.6% |
| Sophomore | 21,245 | 29.4% |
| Junior | 16,986 | 23.5% |
| Senior | 19,878 | 27.5% |
| ***Total*** | ***72,294*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 13 |
| Maximum | 18 |
| Mean (SD) | 16.2 (1.2) |
| n | 59,098 |

| BMI | |
|---|---|
| Minimum | 17.6 |
| Maximum | 35.2 |
| Mean (SD) | 24.3 (3.4) |
| n | 47,854 |

* Throughout this chapter, totals and n's represent the total 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 Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

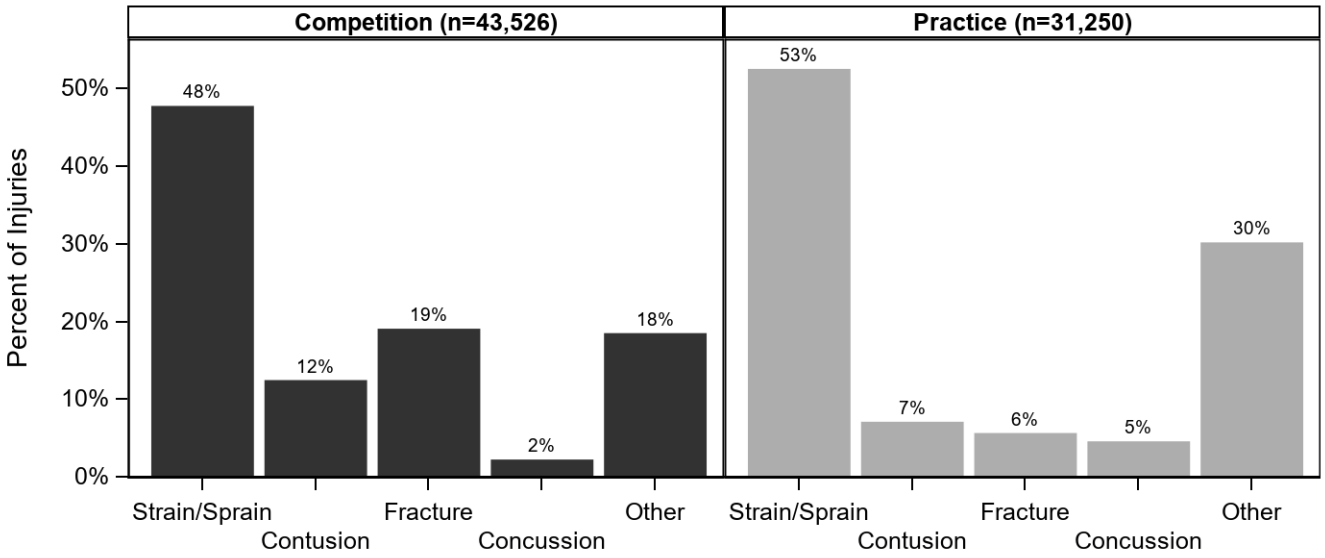



**Table 10.3 Body Site of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Shoulder | 6,228 | 14.3% | 8,532 | 27.3% | 14,760 | 19.7% |
| Hand/Wrist | 11,465 | 26.3% | 2,506 | 8.0% | 13,971 | 18.7% |
| Hip/Thigh/Upper Leg | 5,224 | 12.0% | 3,356 | 10.7% | 8,581 | 11.5% |
| Arm/Elbow | 4,135 | 9.5% | 3,914 | 12.5% | 8,049 | 10.8% |
| Ankle | 5,246 | 12.1% | 1,167 | 3.7% | 6,413 | 8.6% |
| Lower Leg | 2,152 | 4.9% | 3,355 | 10.7% | 5,507 | 7.4% |
| Trunk | 1,917 | 4.4% | 3,153 | 10.1% | 5,070 | 6.8% |
| Head/Face | 2,461 | 5.7% | 2,272 | 7.3% | 4,733 | 6.3% |
| Knee | 1,855 | 4.3% | 1,659 | 5.3% | 3,514 | 4.7% |
| Foot | 1,754 | 4.0% | 800 | 2.6% | 2,554 | 3.4% |
| Other | 1,007 | 2.3% | 536 | 1.7% | 1,543 | 2.1% |
| Neck | 81 | 0.2% | 0 | 0.0% | 81 | 0.1% |
| ***Total*** | ***43,526*** | ***100.0%*** | ***31,250*** | ***100.0%*** | ***74,776*** | ***100.0%*** |

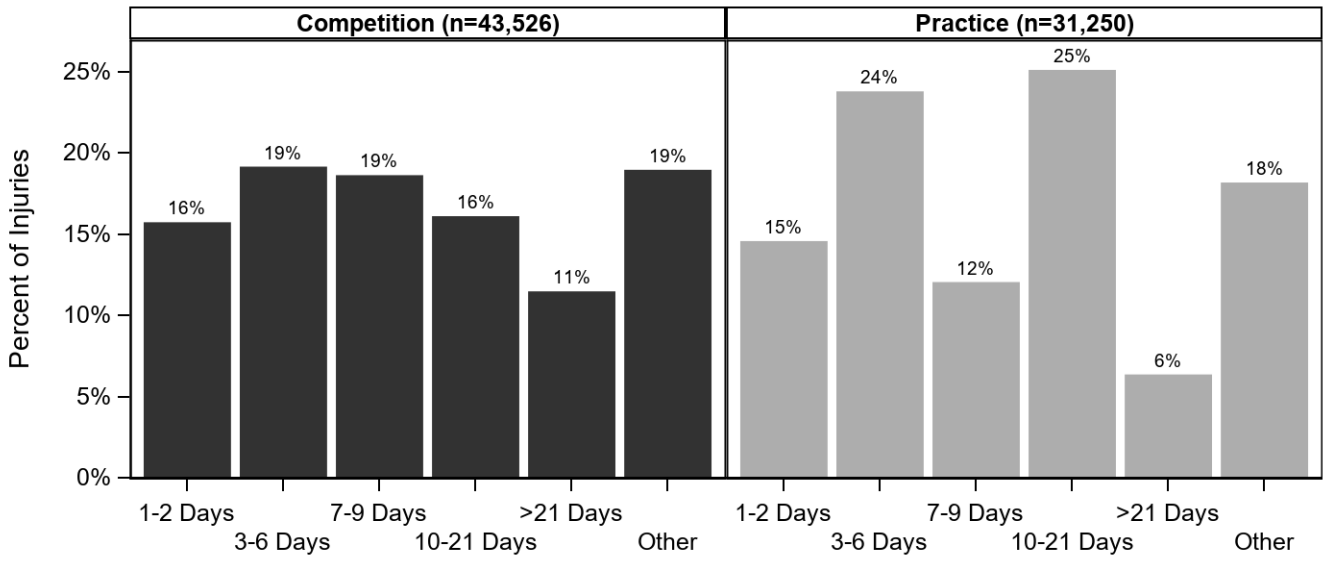
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 10.4 Ten Most Common Boys' Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=43,529) | | Practice (n=31,253) | | Overall (n=74,776) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Shoulder Strain/Sprain | 2,745 | 6.3% | 5,539 | 17.7% | 8,284 | 11.1% |
| Hip/Thigh/Upper Leg Strain/Sprain | 4,296 | 9.9% | 2,993 | 9.6% | 7,288 | 9.7% |
| Hand/Wrist Fracture | 6,255 | 14.4% | 981 | 3.1% | 7,236 | 9.7% |
| Shoulder Other | 3,483 | 8.0% | 2,993 | 9.6% | 6,476 | 8.7% |
| Ankle Strain/Sprain | 5,246 | 12.1% | 1,167 | 3.7% | 6,413 | 8.6% |
| Trunk Strain/Sprain | 1,917 | 4.4% | 2,636 | 8.4% | 4,553 | 6.1% |
| Arm/Elbow Strain/Sprain | 2,398 | 5.5% | 1,371 | 4.4% | 3,768 | 5.0% |
| Knee Other | 1,127 | 2.6% | 1,659 | 5.3% | 2,786 | 3.7% |
| Hand/Wrist Strain/Sprain | 1,809 | 4.2% | 728 | 2.3% | 2,536 | 3.4% |
| Lower Leg Strain/Sprain | 728 | 1.7% | 1,729 | 5.5% | 2,457 | 3.3% |

* Totals and n's represent the total 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 10.2 Time Loss of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Boys' Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 822 | 1.9% | 0 | 0.0% | 822 | 1.1% |
| Did Not Require Surgery | 42,340 | 98.1% | 30,368 | 100.0% | 72,708 | 98.9% |
| ***Total*** | ***43,163*** | ***100.0%*** | ***30,368*** | ***100.0%*** | ***73,531*** | ***100.0%*** |

* Totals and n's represent the total 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 10.3 History of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

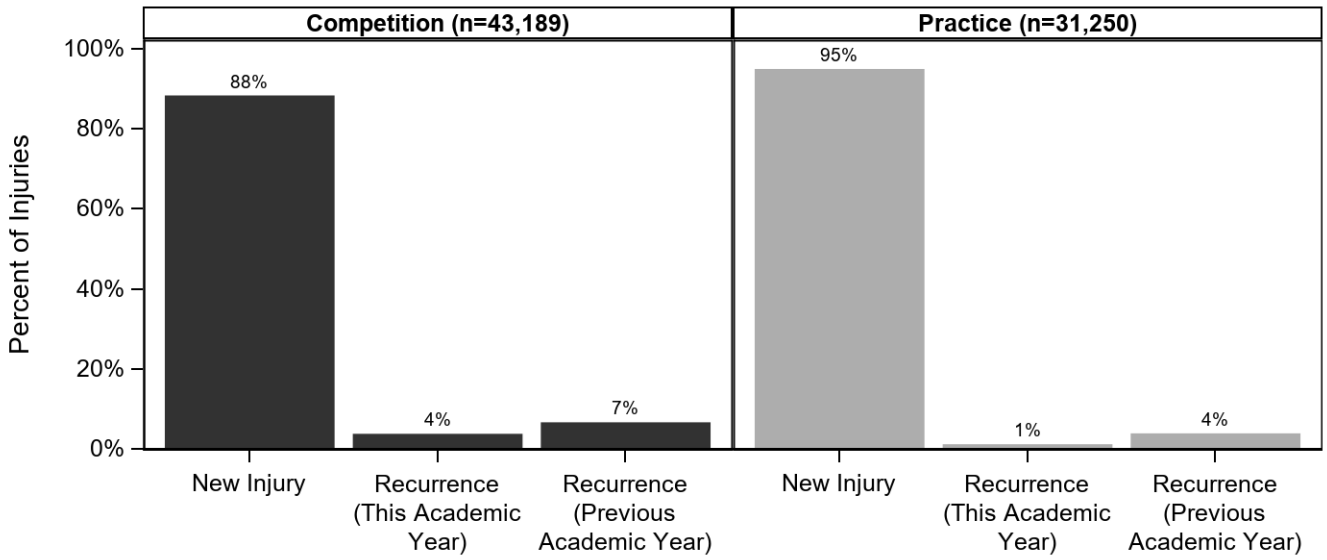



**Table 10.6 Time during Season of Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 16,496 | 22.1% |
| Regular Season | 54,537 | 72.9% |
| Post Season | 3,744 | 5.0% |
| ***Total*** | ***74,776*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 10.7 Competition-Related Variables for Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 3,176 | 7.3% |
| First Inning | 3,744 | 8.6% |
| Second Inning | 3,310 | 7.6% |
| Third Inning | 7,520 | 17.3% |
| Fourth Inning | 3,566 | 8.2% |
| Fifth Inning | 3,026 | 7.0% |
| Sixth Inning | 3,420 | 7.9% |
| Seventh Inning | 2,327 | 5.3% |
| Extra Inning | 364 | 0.8% |
| Unknown | 13,074 | 30.0% |
| ***Total*** | ***43,526*** | ***100.0%*** |

| Field Location | | |
|---|---|---|
| Pitchers Mound | 5,770 | 13.3% |
| Home Plate | 15,734 | 36.1% |
| First Base | 3,412 | 7.8% |
| Second Base | 6,798 | 15.6% |
| Third Base | 2,519 | 5.8% |
| Infield | 1,647 | 3.8% |
| Outfield | 2,457 | 5.6% |
| Other | 1,161 | 2.7% |
| Unknown | 4,029 | 9.3% |
| ***Total*** | ***43,526*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 10.8 Practice-Related Variables for Boys' Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 1,788 | 5.7% |
| Second 1/2 Hour | 2,987 | 9.6% |
| 1-2 Hours into Practice | 12,645 | 40.6% |
| Unknown | 13,748 | 44.1% |
| ***Total*** | ***31,168*** | ***100.0%*** |

* Totals and n's represent the total 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 10.4 Player Position of Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

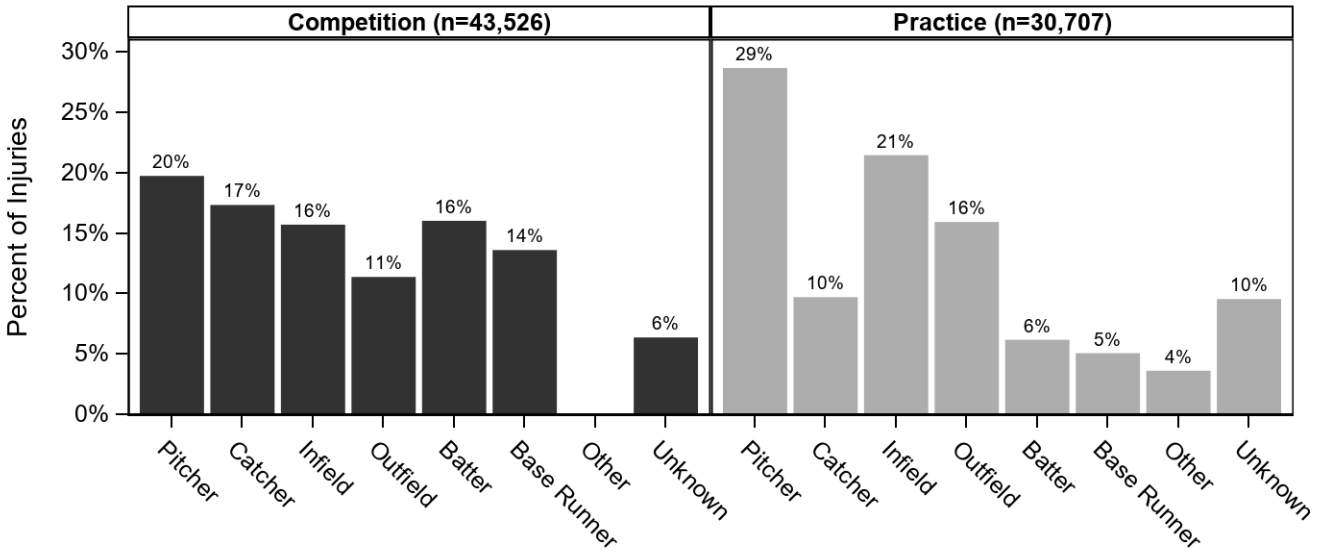


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**Table 10.9 Activities Leading to Boys' Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Pitching | 6,827 | 15.7% | 7,474 | 23.9% | 14,302 | 19.1% |
| Running Bases | 7,760 | 17.8% | 2,507 | 8.0% | 10,268 | 13.7% |
| Batting | 7,796 | 17.9% | 2,340 | 7.5% | 10,136 | 13.6% |
| Catching | 6,395 | 14.7% | 1,399 | 4.5% | 7,794 | 10.4% |
| Sliding | 6,162 | 14.2% | 1,142 | 3.7% | 7,304 | 9.8% |
| Throwing | 1,659 | 3.8% | 5,607 | 17.9% | 7,266 | 9.7% |
| Fielding a Batted Ball | 3,153 | 7.2% | 3,479 | 11.1% | 6,632 | 8.9% |
| Unknown | 778 | 1.8% | 2,401 | 7.7% | 3,179 | 4.3% |
| Conditioning | 364 | 0.8% | 2,713 | 8.7% | 3,077 | 4.1% |
| Other | 1,365 | 3.1% | 797 | 2.6% | 2,162 | 2.9% |
| Fielding a Thrown Ball | 1,267 | 2.9% | 848 | 2.7% | 2,114 | 2.8% |
| General Play | 0 | 0.0% | 543 | 1.7% | 543 | 0.7% |
| ***Total*** | ***43,526*** | ***100.0%*** | ***31,250*** | ***100.0%*** | ***74,776*** | ***100.0%*** |

* Totals and n's represent the total 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.

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**Table 10.10 Activity Resulting in Boys' Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Batting | 1,731 | 4.7% | 4,211 | 55.2% | 1,960 | 19.5% | 81 | 3.4% | 2,152 | 12.3% |
| Catching | 3,209 | 8.6% | 1,365 | 17.9% | 1,491 | 14.8% | 881 | 36.9% | 848 | 4.8% |
| Conditioning | 2,713 | 7.3% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 364 | 2.1% |
| Fielding a Batted Ball | 2,349 | 6.3% | 848 | 11.1% | 1,425 | 14.2% | 907 | 38.0% | 1,104 | 6.3% |
| Fielding a Thrown Ball | 1,185 | 3.2% | 929 | 12.2% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| General Play | 543 | 1.5% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other | 518 | 1.4% | 0 | 0.0% | 1,127 | 11.2% | 0 | 0.0% | 518 | 3.0% |
| Pitching | 10,998 | 29.6% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 3,304 | 18.9% |
| Running Bases | 6,578 | 17.7% | 279 | 3.7% | 1,057 | 10.5% | 518 | 21.7% | 1,836 | 10.5% |
| Sliding | 1,506 | 4.0% | 0 | 0.0% | 2,140 | 21.3% | 0 | 0.0% | 3,658 | 20.9% |
| Throwing | 4,480 | 12.0% | 0 | 0.0% | 778 | 7.7% | 0 | 0.0% | 2,008 | 11.5% |
| Unknown | 1,402 | 3.8% | 0 | 0.0% | 81 | 0.8% | 0 | 0.0% | 1,695 | 9.7% |
| ***Total*** | ***37,212*** | ***100.0%*** | ***7,632*** | ***100.0%*** | ***10,059*** | ***100.0%*** | ***2,387*** | ***100.0%*** | ***17,486*** | ***100.0%*** |

* Totals and n's represent the total 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.

# XI. Girls' Softball Injury Epidemiology

**Table 11.1 Girls' Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | # Injuries | # Exposures | Injury Rate (per 1,000 AEs) | Nationally Estimated # Injuries |
|---|---|---|---|---|
| ***Total*** | ***120*** | ***98,207*** | ***1.22*** | ***74,921*** |
| Competition | 67 | 33,869 | 1.98 | 37,614 |
| Practice | 53 | 64,338 | 0.82 | 37,307 |

* All remaining analyses in this chapter present data weighted to provide national injury estimates.

**Table 11.2 Demographic Characteristics of Injured Girls' Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Year in School | n | % |
|---|---|---|
| Freshman | 15,711 | 21.2% |
| Sophomore | 26,440 | 35.7% |
| Junior | 21,916 | 29.6% |
| Senior | 10,043 | 13.6% |
| ***Total*** | ***74,109*** | ***100.0%*** |

| Age (years) | |
|---|---|
| Minimum | 14 |
| Maximum | 18 |
| Mean (SD) | 15.9 (1.1) |
| n | 59,651 |

| BMI | |
|---|---|
| Minimum | 18.2 |
| Maximum | 36.6 |
| Mean (SD) | 24.0 (4.3) |
| n | 45,498 |

* Throughout this chapter, totals and n's represent the total 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 Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

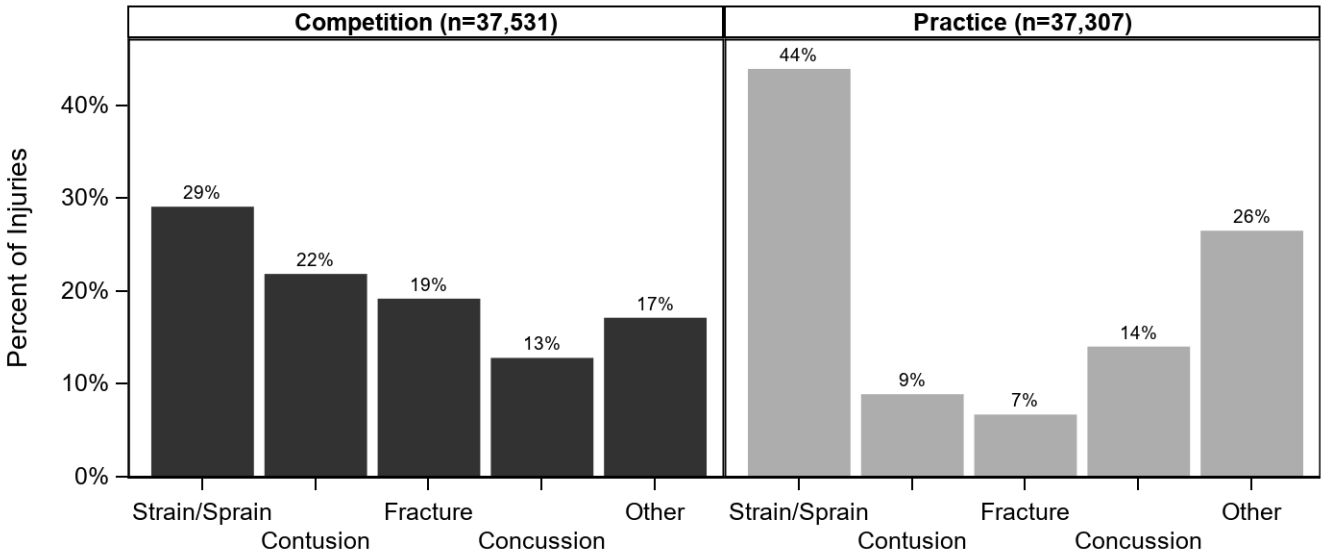



**Table 11.3 Body Site of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Body Site** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face | 6,207 | 16.5% | 8,594 | 23.0% | 14,801 | 19.8% |
| Hand/Wrist | 8,519 | 22.6% | 2,155 | 5.8% | 10,674 | 14.2% |
| Shoulder | 4,202 | 11.2% | 5,910 | 15.8% | 10,111 | 13.5% |
| Ankle | 4,295 | 11.4% | 2,411 | 6.5% | 6,707 | 9.0% |
| Hip/Thigh/Upper Leg | 2,343 | 6.2% | 4,215 | 11.3% | 6,558 | 8.8% |
| Knee | 3,525 | 9.4% | 2,957 | 7.9% | 6,482 | 8.7% |
| Arm/Elbow | 3,096 | 8.2% | 2,663 | 7.1% | 5,759 | 7.7% |
| Trunk | 4,066 | 10.8% | 1,305 | 3.5% | 5,371 | 7.2% |
| Lower Leg | 384 | 1.0% | 3,803 | 10.2% | 4,187 | 5.6% |
| Foot | 676 | 1.8% | 1,021 | 2.7% | 1,697 | 2.3% |
| Systemic | 301 | 0.8% | 1,007 | 2.7% | 1,308 | 1.7% |
| Other | 0 | 0.0% | 1,268 | 3.4% | 1,268 | 1.7% |
| ***Total*** | ***37,614*** | ***100.0%*** | ***37,307*** | ***100.0%*** | ***74,921*** | ***100.0%*** |

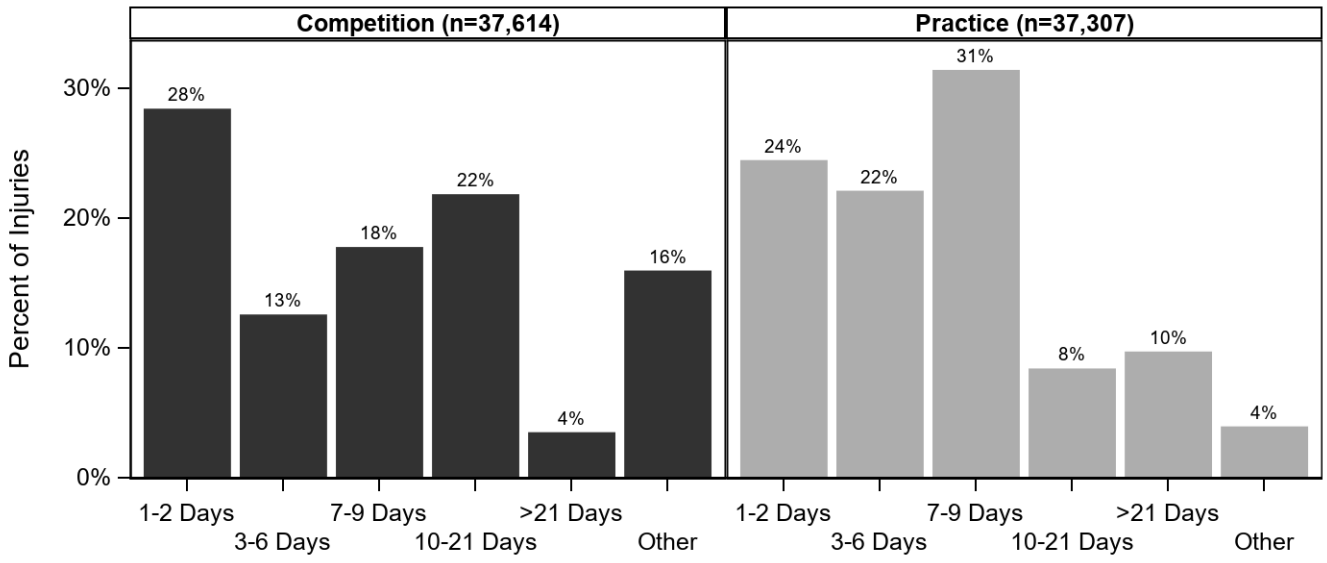
* Totals and n's represent the total weighted number of injury reports containing a valid response for the particular question. Due to a low level of non-response, these totals are always similar but are not always equal to the total number of injuries.

**Table 11.4 Ten Most Common Girls' Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition (n=37,530) | | Practice (n=37,307) | | Overall (n=74,838) | |
|---|---|---|---|---|---|---|
| **Diagnosis** | **n** | **%** | **n** | **%** | **n** | **%** |
| Head/Face Concussion | 4,802 | 12.8% | 5,228 | 14.0% | 10,031 | 13.4% |
| Hip/Thigh/Upper Leg Strain/Sprain | 2,041 | 5.4% | 4,215 | 11.3% | 6,256 | 8.4% |
| Shoulder Strain/Sprain | 1,612 | 4.3% | 3,840 | 10.3% | 5,452 | 7.3% |
| Ankle Strain/Sprain | 2,691 | 7.2% | 2,027 | 5.4% | 4,718 | 6.3% |
| Knee Other | 1,828 | 4.9% | 2,874 | 7.7% | 4,702 | 6.3% |
| Hand/Wrist Fracture | 3,731 | 9.9% | 586 | 1.6% | 4,317 | 5.8% |
| Shoulder Other | 2,079 | 5.5% | 2,069 | 5.5% | 4,149 | 5.5% |
| Hand/Wrist Contusion | 3,685 | 9.8% | 0 | 0.0% | 3,685 | 4.9% |
| Trunk Strain/Sprain | 1,778 | 4.7% | 802 | 2.1% | 2,580 | 3.4% |
| Lower Leg Other | 0 | 0.0% | 2,535 | 6.8% | 2,535 | 3.4% |

* Totals and n's represent the total 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 11.2 Time Loss of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 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 Girls' Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Need for Surgery** | **n** | **%** | **n** | **%** | **n** | **%** |
| Required Surgery | 2,258 | 6.1% | 384 | 1.1% | 2,642 | 3.6% |
| Did Not Require Surgery | 34,845 | 93.9% | 36,121 | 98.9% | 70,966 | 96.4% |
| ***Total*** | ***37,104*** | ***100.0%*** | ***36,505*** | ***100.0%*** | ***73,609*** | ***100.0%*** |

* Totals and n's represent the total 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 11.3 History of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

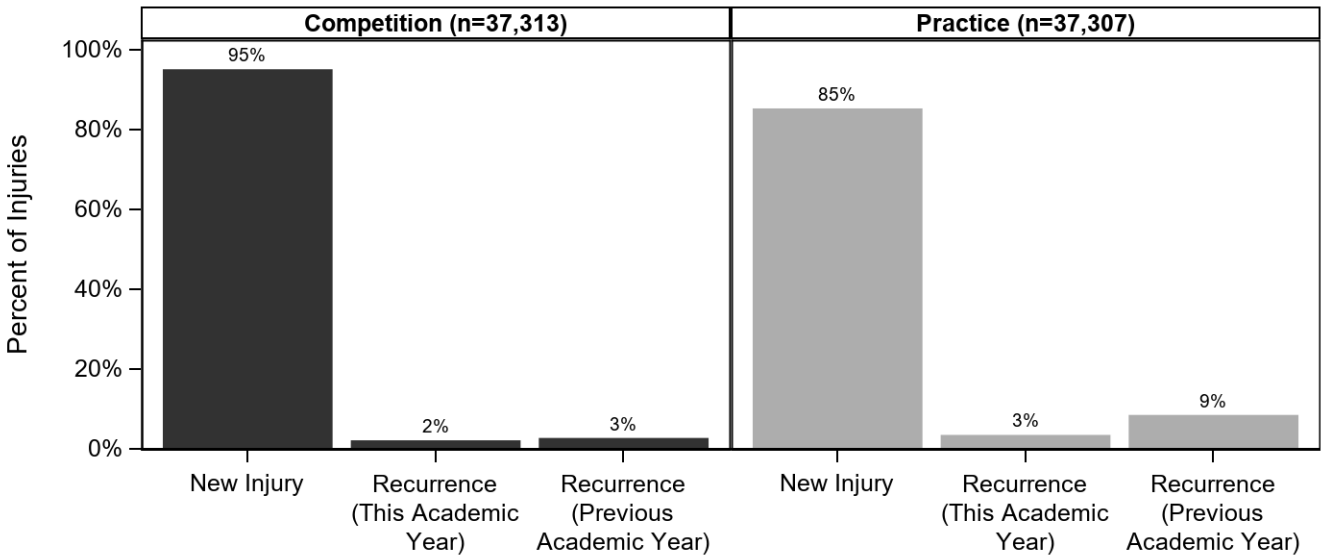



**Table 11.6 Time during Season of Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Season | n | % |
|---|---|---|
| Preseason | 26,687 | 35.9% |
| Regular Season | 44,145 | 59.3% |
| Post Season | 3,578 | 4.8% |
| ***Total*** | ***74,411*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 11.7 Competition-Related Variables for Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Competition | n | % |
|---|---|---|
| Pre-competition/Warm-Ups | 1,976 | 5.4% |
| First Inning | 3,233 | 8.9% |
| Second Inning | 3,990 | 10.9% |
| Third Inning | 3,390 | 9.3% |
| Fourth Inning | 4,713 | 12.9% |
| Fifth Inning | 4,764 | 13.1% |
| Sixth Inning | 1,658 | 4.5% |
| Seventh Inning | 802 | 2.2% |
| Unknown | 11,927 | 32.7% |
| ***Total*** | ***36,454*** | ***100.0%*** |

| Field Location | | |
|---|---|---|
| Unknown | 3,734 | 10.2% |
| Other | 571 | 1.6% |
| Foul Territory | 2,589 | 7.1% |
| Outfield | 4,869 | 13.3% |
| Infield | 593 | 1.6% |
| Third Base | 3,401 | 9.3% |
| Second Base | 1,021 | 2.8% |
| First Base | 4,246 | 11.6% |
| Home Plate | 10,656 | 29.0% |
| Pitchers Mound | 5,043 | 13.7% |
| ***Total*** | ***36,723*** | ***100.0%*** |

* Totals and n's represent the total 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.

**Table 11.8 Practice-Related Variables for Girls' Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time in Practice | n | % |
|---|---|---|
| First 1/2 Hour | 3,586 | 10.0% |
| Second 1/2 Hour | 6,740 | 18.9% |
| 1-2 Hours into Practice | 14,187 | 39.7% |
| >2 Hours into Practice | 503 | 1.4% |
| Unknown | 10,681 | 29.9% |
| ***Total*** | ***35,698*** | ***100.0%*** |

* Totals and n's represent the total 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 11.4 Player Position of Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

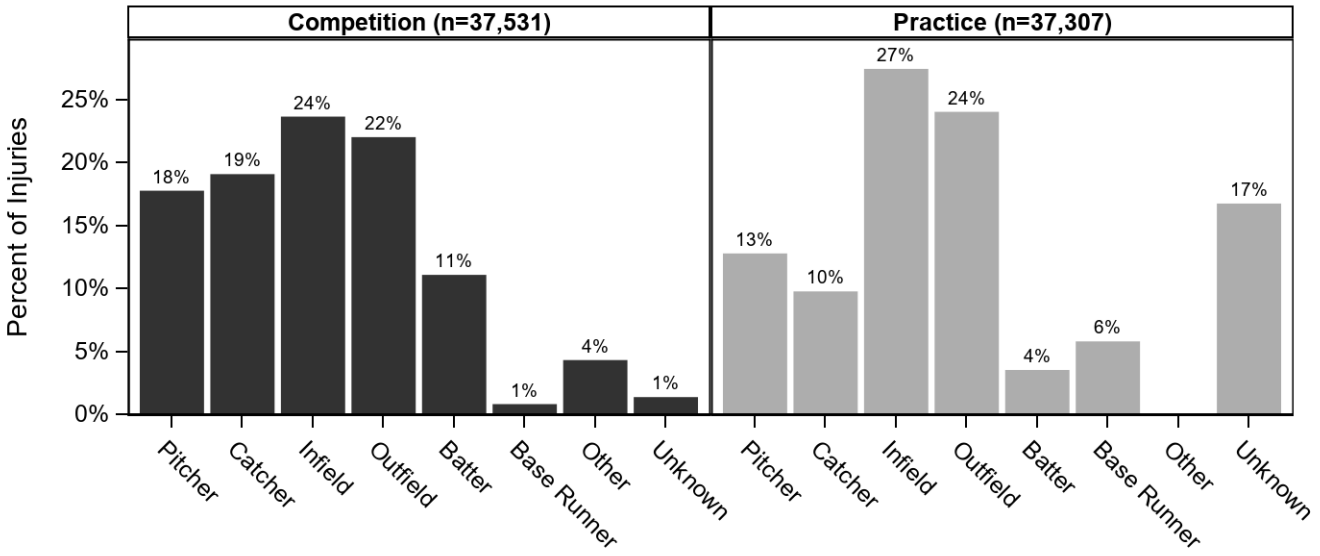


**Table 11.9 Activities Leading to Girls' Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Competition | | Practice | | Overall | |
|---|---|---|---|---|---|---|
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** |
| Catching | 8,187 | 21.8% | 2,791 | 7.5% | 10,978 | 14.7% |
| Running Bases | 5,585 | 14.9% | 5,113 | 13.7% | 10,699 | 14.3% |
| Fielding a Batted Ball | 5,839 | 15.6% | 4,660 | 12.5% | 10,499 | 14.0% |
| Pitching | 5,851 | 15.6% | 3,227 | 8.7% | 9,078 | 12.1% |
| Throwing | 1,322 | 3.5% | 6,886 | 18.5% | 8,207 | 11.0% |
| Unknown | 1,610 | 4.3% | 4,306 | 11.5% | 5,915 | 7.9% |
| General Play | 1,604 | 4.3% | 3,850 | 10.3% | 5,454 | 7.3% |
| Batting | 2,238 | 6.0% | 1,821 | 4.9% | 4,059 | 5.4% |
| Fielding a Thrown Ball | 1,014 | 2.7% | 2,707 | 7.3% | 3,721 | 5.0% |
| Other | 2,454 | 6.5% | 0 | 0.0% | 2,454 | 3.3% |
| Sliding | 1,828 | 4.9% | 83 | 0.2% | 1,911 | 2.6% |
| Conditioning | 0 | 0.0% | 1,862 | 5.0% | 1,862 | 2.5% |
| ***Total*** | ***37,531*** | ***100.0%*** | ***37,307*** | ***100.0%*** | ***74,838*** | ***100.0%*** |

* Totals and n's represent the total 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.

REPORTING INFORMATION ONLINE

**Table 11.10 Activity Resulting in Girls' Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| | Diagnosis | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Strain/Sprain | | Contusion | | Fracture | | Concussion | | Other | |
| **Activity** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** | **n** | **%** |
| Batting | 0 | 0.0% | 1,615 | 14.0% | 1,077 | 11.1% | 773 | 7.7% | 510 | 3.1% |
| Catching | 2,288 | 8.4% | 2,069 | 18.0% | 3,702 | 38.2% | 2,919 | 29.1% | 0 | 0.0% |
| Conditioning | 856 | 3.1% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 1,007 | 6.2% |
| Fielding a Batted Ball | 2,980 | 10.9% | 3,825 | 33.2% | 2,123 | 21.9% | 1,186 | 11.8% | 384 | 2.4% |
| Fielding a Thrown Ball | 812 | 3.0% | 0 | 0.0% | 0 | 0.0% | 1,305 | 13.0% | 1,604 | 9.8% |
| General Play | 1,103 | 4.1% | 510 | 4.4% | 0 | 0.0% | 0 | 0.0% | 3,840 | 23.5% |
| Other | 0 | 0.0% | 0 | 0.0% | 83 | 0.9% | 802 | 8.0% | 1,569 | 9.6% |
| Pitching | 5,293 | 19.5% | 1,569 | 13.6% | 802 | 8.3% | 0 | 0.0% | 1,414 | 8.7% |
| Running Bases | 4,661 | 17.1% | 1,113 | 9.7% | 1,021 | 10.5% | 510 | 5.1% | 3,394 | 20.8% |
| Sliding | 1,021 | 3.8% | 0 | 0.0% | 83 | 0.9% | 0 | 0.0% | 808 | 5.0% |
| Throwing | 5,162 | 19.0% | 0 | 0.0% | 0 | 0.0% | 1,268 | 12.6% | 1,778 | 10.9% |
| Unknown | 3,038 | 11.2% | 808 | 7.0% | 802 | 8.3% | 1,268 | 12.6% | 0 | 0.0% |
| ***Total*** | ***27,214*** | ***100.0%*** | ***11,510*** | ***100.0%*** | ***9,693*** | ***100.0%*** | ***10,031*** | ***100.0%*** | ***16,308*** | ***100.0%*** |

* Totals and n's represent the total 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.

# XII. Gender Differences within Sports

## 12.1 Boys' and Girls' Soccer

**Table 12.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

| | Boys' Soccer | Girls' Soccer * | RR (95% CI) ** |
|---|---|---|---|
| **Total** | 1.89 | **2.69** | **1.43 (1.23-1.66)** |
| Competition | 3.98 | **5.83** | **1.47 (1.22-1.77)** |
| Practice | 1.00 | **1.33** | **1.33 (1.04-1.71)** |

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.

**Table 12.2 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Body Site | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| Head/Face | 12.6% | **21.8%** | **1.74 (1.15-2.62)** |
| Neck | **1.0%** | 0.0% | **27.08 (2.60-282.08)** |
| Shoulder | 1.0% | **1.0%** | 1.03 (0.17-6.35) |
| Trunk | **4.3%** | 2.4% | 1.79 (0.69-4.62) |
| Arm/Elbow | **1.6%** | 0.4% | 3.90 (0.62-24.38) |
| Hand/Wrist | 3.3% | **4.8%** | 1.43 (0.61-3.32) |
| Hip/Thigh/Upper Leg | **17.9%** | 15.5% | 1.16 (0.79-1.70) |
| Knee | **18.2%** | 18.2% | 1.00 (0.68-1.47) |
| Lower Leg | **8.2%** | 5.5% | 1.50 (0.78-2.87) |
| Ankle | **22.2%** | 21.8% | 1.02 (0.73-1.41) |
| Foot | **7.5%** | 5.0% | 1.52 (0.75-3.07) |
| Other | **1.9%** | 1.2% | 1.67 (0.39-7.07) |
| Systemic | 0.3% | **2.5%** | **9.98 (1.94-51.47)** |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.3 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| Strain/Sprain | **50.6%** | 46.6% | 1.08 (0.90-1.30) |
| Contusion | **14.4%** | 9.7% | 1.49 (0.93-2.37) |
| Fracture | **7.7%** | 6.3% | 1.22 (0.63-2.36) |
| Concussion | 9.4% | **20.7%** | **2.20 (1.39-3.49)** |
| Other | **17.9%** | 16.7% | 1.07 (0.72-1.59) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.4 Most Common Boys' and Girls' Soccer Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| Ankle Strain/Sprain | 17.6% | **19.4%** | 1.10 (0.77-1.58) |
| Head/Face Concussion | 9.4% | **20.7%** | **2.20 (1.39-3.49)** |
| Hip/Thigh/Upper Leg Strain/Sprain | **14.2%** | 13.1% | 1.09 (0.70-1.69) |
| Knee Other | **8.5%** | 5.8% | 1.47 (0.77-2.81) |
| Knee Strain/Sprain | 6.6% | **8.0%** | 1.21 (0.63-2.30) |

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

**Table 12.5 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time Loss | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| 1-2 Days | **27.0%** | 17.1% | **1.58 (1.13-2.20)** |
| 3-6 Days | **31.7%** | 22.8% | **1.39 (1.04-1.87)** |
| 7-9 Days | 8.8% | **15.0%** | **1.70 (1.05-2.77)** |
| 10-21 Days | 13.3% | **21.2%** | **1.59 (1.08-2.34)** |
| >21 Days | **6.1%** | 3.0% | 2.01 (0.88-4.58) |
| Other | 13.2% | **20.9%** | **1.59 (1.06-2.39)** |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.6 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Soccer Mechanism | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| Contact with Another Player | 24.4% | **24.8%** | 1.02 (0.74-1.40) |
| Contact with Ball | 11.9% | **15.0%** | 1.26 (0.79-2.00) |
| Contact with Goal | 0.4% | **0.8%** | 2.25 (0.23-22.15) |
| N/A ** | 14.6% | **16.9%** | 1.16 (0.76-1.76) |
| Other | **16.6%** | 9.2% | **1.80 (1.10-2.96)** |
| Rotation Around a Planted Foot/Inversion | 9.7% | **14.6%** | 1.51 (0.96-2.39) |
| Slide Tackle | **6.5%** | 1.7% | **3.75 (1.27-11.01)** |
| Stepped On/Fell On/Kicked | **8.9%** | 7.7% | 1.17 (0.65-2.08) |
| Uneven Playing Surface | 0.0% | **2.8%** | **67.43 (8.46-537.64)** |
| Unknown | **7.1%** | 6.5% | 1.09 (0.56-2.11) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

**Table 12.7 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Soccer Activity | Boys' Soccer | Girls' Soccer | IPR (95% CI) |
|---|---|---|---|
| Attempting a Slide Tackle | **1.5%** | 0.3% | 5.29 (0.57-48.73) |
| Ball Handling/Dribbling | **9.0%** | 7.5% | 1.20 (0.66-2.16) |
| Blocking Shot | **1.8%** | 1.3% | 1.37 (0.31-6.00) |
| Chasing Loose Ball | 8.8% | **10.9%** | 1.23 (0.72-2.10) |
| Conditioning | 2.4% | **4.7%** | 1.93 (0.71-5.27) |
| Defending | **13.1%** | 12.0% | 1.09 (0.69-1.72) |
| General Play | **28.6%** | 27.6% | 1.03 (0.77-1.39) |
| Goaltending | 6.6% | **6.6%** | 1.01 (0.52-1.96) |
| Heading Ball | **3.9%** | 3.7% | 1.04 (0.45-2.39) |
| Other | 2.5% | **4.0%** | 1.59 (0.56-4.49) |
| Passing | **3.2%** | 0.4% | **7.73 (1.46-41.00)** |
| Receiving Pass | **2.0%** | 1.5% | 1.37 (0.39-4.82) |
| Receiving a Slide Tackle | 0.3% | **1.7%** | **6.39 (1.15-35.50)** |
| Shooting | **7.6%** | 4.2% | 1.81 (0.88-3.75) |
| Unknown | 8.7% | **13.6%** | 1.56 (0.93-2.62) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

## 12.2 Boys' and Girls' Basketball

**Table 12.8 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

| | Boys' Basketball | Girls' Basketball * | RR (95% CI) ** |
|---|---|---|---|
| **Total** | 1.59 | **2.36** | **1.49 (1.26-1.76)** |
| Competition | 2.60 | **5.14** | **1.98 (1.59-2.45)** |
| Practice | **1.11** | 1.04 | 1.07 (0.81-1.41) |

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.

**Table 12.9 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Body Site | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| Head/Face | 16.4% | **17.1%** | 1.04 (0.69-1.57) |
| Neck | 0.3% | **0.4%** | 1.10 (0.07-17.84) |
| Shoulder | 3.1% | **3.5%** | 1.14 (0.43-3.03) |
| Trunk | **5.5%** | 1.6% | **3.49 (1.13-10.71)** |
| Arm/Elbow | 1.1% | **1.8%** | 1.63 (0.34-7.76) |
| Hand/Wrist | 8.9% | **8.9%** | 1.00 (0.57-1.77) |
| Hip/Thigh/Upper Leg | **8.5%** | 2.6% | **3.22 (1.42-7.30)** |
| Knee | 8.8% | **18.5%** | **2.17 (1.33-3.55)** |
| Lower Leg | 3.7% | **4.9%** | 1.32 (0.54-3.24) |
| Ankle | **37.8%** | 35.6% | 1.06 (0.83-1.36) |
| Foot | 4.2% | **4.3%** | 1.01 (0.40-2.59) |
| Systemic | **1.8%** | 0.9% | 2.10 (0.39-11.17) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.10 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| Strain/Sprain | 56.2% | **60.2%** | 1.07 (0.92-1.25) |
| Contusion | **7.6%** | 4.5% | 1.68 (0.80-3.50) |
| Fracture | **11.8%** | 4.9% | **2.43 (1.23-4.77)** |
| Concussion | 9.8% | **14.7%** | 1.50 (0.90-2.49) |
| Other | 14.5% | **15.7%** | 1.08 (0.70-1.67) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.11 Most Common Boys' and Girls' Basketball Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| Ankle Strain/Sprain | 34.6% | **34.8%** | 1.00 (0.78-1.30) |
| Hand/Wrist Strain/Sprain | 4.3% | **6.8%** | 1.57 (0.72-3.45) |
| Head/Face Concussion | 9.8% | **14.7%** | 1.50 (0.90-2.49) |
| Hip/Thigh/Upper Leg Strain/Sprain | **5.6%** | 1.7% | **3.25 (1.12-9.45)** |
| Knee Other | 3.3% | **6.9%** | 2.05 (0.86-4.88) |
| Knee Strain/Sprain | 3.4% | **9.8%** | **2.89 (1.40-5.93)** |

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

**Table 12.12 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time Loss | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| 1-2 Days | 20.8% | **25.7%** | 1.24 (0.88-1.74) |
| 3-6 Days | **22.2%** | 17.7% | 1.26 (0.86-1.83) |
| 7-9 Days | **14.6%** | 12.6% | 1.17 (0.73-1.86) |
| 10-21 Days | **17.5%** | 15.8% | 1.11 (0.74-1.68) |
| >21 Days | **8.7%** | 8.4% | 1.04 (0.57-1.90) |
| Other | 16.1% | **19.7%** | 1.24 (0.83-1.86) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.13 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Basketball Mechanism | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| Collision with Another Player | 24.1% | **25.4%** | 1.06 (0.76-1.46) |
| Contact with Ball | 3.9% | **4.9%** | 1.24 (0.56-2.74) |
| Jumping/Landing | **23.2%** | 21.2% | 1.10 (0.77-1.56) |
| N/A ** | 8.8% | **9.5%** | 1.08 (0.58-1.99) |
| Other | **15.7%** | 9.2% | **1.71 (1.01-2.89)** |
| Rotation Around a Planted Foot/Inversion | 12.5% | **14.0%** | 1.12 (0.69-1.82) |
| Stepped On/Fell On/Kicked | 7.5% | **9.2%** | 1.23 (0.67-2.27) |
| Unknown | 4.2% | **6.6%** | 1.57 (0.69-3.59) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

**Table 12.14 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Basketball Activity | Boys' Basketball | Girls' Basketball | IPR (95% CI) |
|---|---|---|---|
| Ball Handling/Dribbling | 3.7% | **6.5%** | 1.75 (0.76-4.02) |
| Chasing Loose Ball | 5.3% | **9.5%** | 1.77 (0.90-3.49) |
| Conditioning | **4.2%** | 1.2% | 3.52 (0.88-14.00) |
| Defending | 14.6% | **18.1%** | 1.24 (0.81-1.88) |
| General Play | 17.4% | **18.6%** | 1.07 (0.71-1.60) |
| Other | **2.8%** | 1.6% | 1.75 (0.45-6.81) |
| Passing | **0.7%** | 0.0% | -- |
| Rebounding | **21.6%** | 18.9% | 1.15 (0.79-1.67) |
| Receiving Pass | 2.0% | **4.9%** | 2.47 (0.81-7.54) |
| Screening | **0.9%** | 0.0% | -- |
| Shooting | **8.5%** | 5.1% | 1.68 (0.87-3.22) |
| Unknown | **18.2%** | 15.7% | 1.15 (0.75-1.76) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

## 12.3 Boys' Baseball and Girls' Softball

**Table 12.15 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year**

| | Boys' Baseball | Girls' Softball * | RR (95% CI) ** |
|---|---|---|---|
| **Total** | 1.06 | **1.22** | 1.15 (0.91-1.46) |
| Competition | 1.84 | **1.98** | 1.07 (0.78-1.46) |
| Practice | 0.65 | **0.82** | 1.28 (0.89-1.84) |

* 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.
** Throughout this chapter, statistically significant RR and IPR are bolded.

**Table 12.16 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Body Site | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| Head/Face | 6.3% | **19.8%** | **3.12 (1.48-6.59)** |
| Neck | **0.1%** | 0.0% | -- |
| Shoulder | **19.7%** | 13.5% | 1.46 (0.75-2.85) |
| Trunk | 6.8% | **7.2%** | 1.06 (0.38-2.95) |
| Arm/Elbow | **10.8%** | 7.7% | 1.40 (0.56-3.52) |
| Hand/Wrist | **18.7%** | 14.2% | 1.31 (0.70-2.46) |
| Hip/Thigh/Upper Leg | **11.5%** | 8.8% | 1.31 (0.58-2.97) |
| Knee | 4.7% | **8.7%** | 1.84 (0.66-5.14) |
| Lower Leg | **7.4%** | 5.6% | 1.32 (0.40-4.29) |
| Ankle | 8.6% | **9.0%** | 1.04 (0.46-2.38) |
| Foot | **3.4%** | 2.3% | 1.58 (0.39-6.48) |
| Other | **2.1%** | 1.7% | 1.22 (0.14-10.31) |
| Systemic | 0.0% | **1.7%** | -- |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.17 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| Strain/Sprain | **49.8%** | 36.5% | 1.36 (0.98-1.90) |
| Contusion | 10.2% | **15.4%** | 1.51 (0.71-3.18) |
| Fracture | **13.5%** | 13.0% | 1.04 (0.52-2.06) |
| Concussion | 3.2% | **13.4%** | **4.20 (1.55-11.34)** |
| Other | **23.4%** | 21.8% | 1.07 (0.64-1.80) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.18 Most Common Baseball and Softball Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Diagnosis | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| Ankle Strain/Sprain | **8.6%** | 6.3% | 1.36 (0.56-3.28) |
| Arm/Elbow Strain/Sprain | **5.0%** | 3.1% | 1.62 (0.48-5.47) |
| Hand/Wrist Fracture | **9.7%** | 5.8% | 1.68 (0.67-4.21) |
| Head/Face Concussion | 3.2% | **13.4%** | **4.20 (1.55-11.34)** |
| Hip/Thigh/Upper Leg Strain/Sprain | **9.7%** | 8.4% | 1.17 (0.49-2.77) |
| Knee Other | 3.7% | **6.3%** | 1.69 (0.49-5.78) |
| Shoulder Other | **8.7%** | 5.5% | 1.56 (0.52-4.72) |
| Shoulder Strain/Sprain | **11.1%** | 7.3% | 1.52 (0.59-3.89) |
| Trunk Strain/Sprain | **6.1%** | 3.4% | 1.77 (0.44-7.10) |

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

**Table 12.19 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Time Loss | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| 1-2 Days | 15.2% | **26.4%** | 1.74 (0.98-3.06) |
| 3-6 Days | **21.1%** | 17.3% | 1.22 (0.69-2.18) |
| 7-9 Days | 15.9% | **24.5%** | 1.55 (0.89-2.70) |
| 10-21 Days | **19.9%** | 15.1% | 1.31 (0.76-2.27) |
| >21 Days | **9.3%** | 6.6% | 1.41 (0.52-3.84) |
| Other | **18.6%** | 10.0% | 1.87 (0.94-3.72) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

**Table 12.20 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Baseball Mechanism | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| Contact with Another Player | **8.3%** | 7.1% | 1.17 (0.47-2.90) |
| Contact with Bases | **7.5%** | 5.1% | 1.48 (0.54-4.04) |
| Contact with Thrown Ball (Non-Pitch) | 3.5% | **11.0%** | 3.14 (0.94-10.46) |
| Hit by Batted Ball | 3.7% | **9.4%** | 2.51 (0.84-7.45) |
| Hit by Pitch | **11.1%** | 7.2% | 1.54 (0.66-3.61) |
| N/A ** | **20.0%** | 14.4% | 1.39 (0.72-2.66) |
| Other | 13.3% | **26.1%** | **1.97 (1.11-3.48)** |
| Rotation Around a Planted Foot/Inversion | **10.6%** | 5.1% | 2.06 (0.85-5.00) |
| Throwing (Not Pitching) | 4.8% | **7.7%** | 1.61 (0.53-4.85) |
| Throwing (Pitching) | **13.0%** | 4.6% | **2.80 (1.08-7.26)** |
| Unknown | **4.3%** | 2.3% | 1.86 (0.44-7.89) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.
** Includes overuse, heat illness, conditioning, etc.

**Table 12.21 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2023-24 School Year ***

| Baseball Activity | Boys' Baseball | Girls' Softball | IPR (95% CI) |
|---|---|---|---|
| Batting | **13.6%** | 5.4% | **2.50 (1.07-5.86)** |
| Catching | 10.4% | **14.7%** | 1.41 (0.68-2.91) |
| Conditioning | **4.1%** | 2.5% | 1.65 (0.48-5.68) |
| Fielding a Batted Ball | 8.9% | **14.0%** | 1.58 (0.74-3.37) |
| Fielding a Thrown Ball | 2.8% | **5.0%** | 1.76 (0.44-6.98) |
| General Play | 0.7% | **7.3%** | **10.03 (1.22-82.35)** |
| Other | 2.9% | **3.3%** | 1.13 (0.23-5.61) |
| Pitching | **19.1%** | 12.1% | 1.58 (0.81-3.06) |
| Running Bases | 13.7% | **14.3%** | 1.04 (0.53-2.03) |
| Sliding | **9.8%** | 2.6% | **3.82 (1.11-13.18)** |
| Throwing | 9.7% | **11.0%** | 1.13 (0.49-2.60) |
| Unknown | 4.3% | **7.9%** | 1.86 (0.54-6.39) |
| ***Total*** | ***100.0%*** | ***100.0%*** | **--** |

* Totals are not always equal to 100% due to slight rounding or missing responses.

REPORTING INFORMATION ONLINE

# XIII. TRENDS OVER TIME

REPORTING INFORMATION ONLINE

## Table 13.1 Injury Rates by Sport, Type of Exposure, and Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | P-Value for Trend |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall | Total | 2.46 | 2.53 | 2.28 | 1.96 | 2.03 | 1.97 | 2.17 | 2.16 | 2.18 | 2.13 | 2.32 | 2.07 | 2.45 | 2.29 | 2.31 | 2.01 | 2.36 | 2.41 | 2.25 | 0.7440 |
| | Competition | 4.50 | 4.74 | 4.36 | 3.93 | 4.06 | 4.12 | 4.26 | 4.31 | 4.22 | 4.40 | 4.74 | 4.25 | 4.88 | 4.61 | 5.16 | 3.84 | 4.53 | 4.93 | 4.71 | 0.1063 |
| | Practice | 1.67 | 1.71 | 1.51 | 1.24 | 1.28 | 1.16 | 1.40 | 1.34 | 1.39 | 1.28 | 1.39 | 1.21 | 1.47 | 1.38 | 1.30 | 1.36 | 1.47 | 1.46 | 1.29 | 0.2372 |
| Boys' Football | Total | 4.25 | 4.33 | 4.09 | 3.41 | 3.64 | 3.50 | 3.78 | 3.87 | 3.74 | 3.73 | 4.08 | 3.56 | 4.33 | 3.85 | 3.84 | 3.39 | 4.12 | 3.80 | 3.57 | 0.3788 |
| | Competition | 11.72 | 13.12 | 12.45 | 10.94 | 12.30 | 12.30 | 12.41 | 12.53 | 11.38 | 11.97 | 12.68 | 11.55 | 14.13 | 12.09 | 13.07 | 12.11 | 13.27 | 12.84 | 12.61 | 0.1433 |
| | **Practice** | **2.49** | **2.61** | **2.43** | **1.88** | **1.99** | **1.74** | **2.16** | **2.08** | **2.15** | **2.06** | **2.18** | **1.89** | **2.14** | **2.00** | **1.77** | **1.88** | **2.13** | **1.92** | **1.68** | **0.0058** |
| Boys' Soccer | Total | 2.39 | 2.19 | 1.75 | 1.59 | 1.73 | 1.56 | 1.64 | 1.52 | 1.62 | 1.60 | 1.87 | 1.47 | 1.94 | 1.83 | 1.59 | 1.80 | 1.76 | 1.80 | 1.89 | 0.4047 |
| | Competition | 4.14 | 4.13 | 3.63 | 3.35 | 3.31 | 3.08 | 3.47 | 3.28 | 3.40 | 3.43 | 3.95 | 3.25 | 3.92 | 3.86 | 3.35 | 3.30 | 3.76 | 3.82 | 3.98 | 0.8197 |
| | Practice | 1.56 | 1.41 | 0.95 | 0.85 | 1.04 | 0.90 | 0.90 | 0.78 | 0.82 | 0.78 | 0.91 | 0.67 | 1.04 | 0.92 | 0.82 | 1.25 | 0.90 | 0.91 | 1.00 | 0.1547 |
| Girls' Soccer | Total | 2.32 | 2.44 | 2.31 | 2.00 | 1.96 | 1.93 | 2.42 | 2.29 | 2.47 | 2.64 | 2.59 | 2.46 | 2.82 | 2.72 | 2.22 | 2.06 | 2.34 | 2.45 | 2.69 | 0.1034 |
| | Competition | 5.14 | 5.22 | 5.06 | 4.44 | 4.63 | 4.13 | 5.68 | 5.54 | 5.72 | 6.11 | 5.93 | 5.91 | 5.83 | 5.70 | 5.12 | 4.38 | 5.09 | 5.55 | 5.83 | 0.1863 |
| | Practice | 1.08 | 1.29 | 1.15 | 0.96 | 0.81 | 0.93 | 1.09 | 0.92 | 1.04 | 1.09 | 1.09 | 0.85 | 1.48 | 1.34 | 1.06 | 1.16 | 1.07 | 1.11 | 1.33 | 0.1966 |
| Girls' Volleyball | Total | 1.59 | 1.34 | 1.21 | 0.83 | 0.97 | 0.96 | 1.00 | 0.89 | 0.99 | 1.11 | 1.19 | 1.09 | 1.54 | 1.34 | 1.25 | 1.02 | 1.25 | 1.28 | 1.02 | 0.8404 |
| | Competition | 1.88 | 1.34 | 1.38 | 0.82 | 0.99 | 1.18 | 1.27 | 1.08 | 1.15 | 1.39 | 1.52 | 1.61 | 2.18 | 1.58 | 1.84 | 1.40 | 1.67 | 1.65 | 1.11 | 0.1796 |
| | Practice | 1.42 | 1.34 | 1.13 | 0.84 | 0.97 | 0.85 | 0.85 | 0.78 | 0.91 | 0.97 | 1.02 | 0.83 | 1.20 | 1.23 | 0.95 | 0.86 | 1.03 | 1.09 | 0.98 | 0.3866 |
| Boys' Basketball | Total | 1.82 | 1.72 | 1.38 | 1.33 | 1.43 | 1.35 | 1.40 | 1.47 | 1.45 | 1.08 | 1.48 | 1.54 | 1.54 | 1.61 | 1.52 | 1.87 | 1.75 | 1.91 | 1.59 | 0.1472 |
| | **Competition** | **2.87** | **2.82** | **2.20** | **2.29** | **2.69** | **2.39** | **2.60** | **2.44** | **2.40** | **1.98** | **2.84** | **2.65** | **2.74** | **3.09** | **2.74** | **2.95** | **3.07** | **3.33** | **2.60** | **0.0411** |
| | Practice | 1.40 | 1.26 | 1.04 | 0.94 | 0.90 | 0.91 | 0.91 | 1.04 | 1.02 | 0.68 | 0.90 | 1.04 | 1.01 | 0.98 | 0.99 | 1.45 | 1.14 | 1.33 | 1.11 | 0.5816 |
| **Girls' Basketball** | **Total** | **2.02** | **2.03** | **1.57** | **1.47** | **1.56** | **1.73** | **1.57** | **1.83** | **1.88** | **1.65** | **2.14** | **1.87** | **2.15** | **1.95** | **2.06** | **1.87** | **2.43** | **2.14** | **2.36** | **0.0031** |
| | **Competition** | **3.56** | **3.52** | **3.19** | **2.95** | **2.84** | **3.59** | **3.03** | **3.13** | **3.66** | **3.27** | **4.17** | **3.63** | **4.12** | **3.63** | **4.01** | **3.14** | **3.96** | **4.79** | **5.14** | **0.0015** |
| | Practice | 1.40 | 1.39 | 0.88 | 0.86 | 0.99 | 0.92 | 0.98 | 1.24 | 1.08 | 0.94 | 1.24 | 1.03 | 1.26 | 1.21 | 1.22 | 1.37 | 1.73 | 1.01 | 1.04 | 0.3093 |
| Boys' Wrestling | Total | 2.47 | 2.45 | 2.30 | 2.14 | 1.92 | 2.01 | 2.50 | 2.33 | 2.48 | 2.12 | 2.23 | 1.92 | 2.65 | 2.52 | 2.38 | 1.70 | 2.96 | 3.10 | 2.48 | 0.1911 |
| | **Competition** | **3.73** | **3.70** | **3.68** | **3.22** | **3.00** | **3.32** | **3.56** | **3.54** | **3.95** | **3.76** | **3.43** | **3.64** | **4.30** | **4.46** | **4.08** | **2.75** | **5.39** | **5.27** | **4.26** | **0.0131** |
| | Practice | 2.07 | 2.00 | 1.80 | 1.75 | 1.52 | 1.55 | 2.10 | 1.88 | 1.95 | 1.61 | 1.83 | 1.32 | 2.04 | 1.84 | 1.81 | 1.41 | 2.13 | 2.38 | 1.85 | 0.7026 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boys' Baseball | Total | 1.18 | 1.25 | 0.94 | 0.78 | 0.82 | 0.81 | 0.83 | 0.88 | 1.01 | 0.94 | 0.84 | 0.74 | 0.95 | 1.03 | 0.70 | 1.05 | 0.96 | 1.33 | 1.06 | 0.7344 |
| | Competition | 1.71 | 2.03 | 1.37 | 1.32 | 1.27 | 1.49 | 1.14 | 1.30 | 1.68 | 1.67 | 1.35 | 1.23 | 1.28 | 1.66 | 0.46 | 1.44 | 1.36 | 1.92 | 1.84 | 0.7808 |
| | Practice | 0.88 | 0.82 | 0.71 | 0.48 | 0.57 | 0.46 | 0.65 | 0.66 | 0.63 | 0.55 | 0.56 | 0.44 | 0.77 | 0.68 | 0.74 | 0.82 | 0.72 | 1.01 | 0.65 | 0.4174 |
| Girls' Softball | Total | 1.13 | 1.11 | 1.26 | 1.03 | 1.11 | 0.94 | 1.46 | 1.15 | 0.99 | 1.00 | 1.30 | 1.34 | 1.34 | 1.43 | 0.91 | 1.24 | 1.55 | 1.50 | 1.22 | 0.0639 |
| | Competition | 1.76 | 1.96 | 1.82 | 1.60 | 1.66 | 1.45 | 2.04 | 1.96 | 1.09 | 1.67 | 2.10 | 1.55 | 1.94 | 2.19 | 1.74 | 1.74 | 1.93 | 2.14 | 1.98 | 0.2060 |
| | **Practice** | **0.79** | **0.65** | **0.95** | **0.72** | **0.82** | **0.69** | **1.16** | **0.73** | **0.93** | **0.65** | **0.87** | **1.21** | **1.01** | **1.01** | **0.69** | **0.96** | **1.33** | **1.16** | **0.82** | **0.0452** |

* Statistically significant tests for trend are bolded. COVID-19 may have affected these results.

REPORTING INFORMATION ONLINE

## Table 13.2 Nationally Estimated Number of Injuries by Sport, Type of Exposure, and Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall | Total | 1,422,835 | 1,443,423 | 1,401,275 | 1,214,878 | 1,330,664 | 1,195,816 | 1,392,262 | 1,361,986 | 1,427,315 | 1,196,479 | 1,393,566 | 1,160,321 | 1,367,995 | 1,307,414 | 983,683 | 1,237,273 | 1,385,717 | 1,534,842 | 1,499,393 |
| | Competition | 746,284 | 748,874 | 748,558 | 668,031 | 738,454 | 711,642 | 740,493 | 779,055 | 790,966 | 708,150 | 801,156 | 699,410 | 798,725 | 748,085 | 551,249 | 619,712 | 766,617 | 894,718 | 871,776 |
| | Practice | 676,551 | 694,549 | 652,717 | 546,847 | 592,210 | 484,174 | 651,769 | 582,931 | 636,349 | 488,329 | 592,410 | 460,911 | 569,270 | 559,329 | 432,434 | 617,561 | 619,100 | 640,124 | 627,617 |
| Boys' Football | Total | 505,908 | 561,470 | 605,644 | 513,455 | 560,100 | 483,016 | 559,064 | 616,209 | 624,470 | 529,483 | 568,789 | 444,281 | 463,626 | 455,449 | 392,734 | 485,416 | 478,688 | 552,396 | 562,530 |
| | Competition | 274,446 | 285,252 | 304,470 | 279,816 | 310,130 | 296,199 | 287,710 | 344,097 | 324,354 | 286,421 | 316,308 | 252,462 | 281,790 | 259,317 | 236,338 | 248,398 | 276,694 | 336,471 | 332,956 |
| | Practice | 231,462 | 276,218 | 301,174 | 233,639 | 249,970 | 186,817 | 271,354 | 272,112 | 300,116 | 243,062 | 252,481 | 191,819 | 181,836 | 196,132 | 156,396 | 237,018 | 201,994 | 215,925 | 229,574 |
| Boys' Soccer | Total | 215,490 | 168,604 | 159,009 | 147,341 | 152,237 | 138,974 | 172,070 | 149,049 | 149,278 | 133,919 | 174,811 | 145,215 | 180,607 | 184,656 | 134,036 | 143,124 | 174,322 | 198,877 | 192,806 |
| | Competition | 116,987 | 90,461 | 99,785 | 85,837 | 82,737 | 81,238 | 97,540 | 89,429 | 90,683 | 89,091 | 111,720 | 98,031 | 113,655 | 120,217 | 77,322 | 71,425 | 111,007 | 120,281 | 118,247 |
| | Practice | 98,503 | 78,143 | 59,224 | 61,504 | 69,500 | 57,736 | 74,530 | 59,620 | 58,595 | 44,828 | 63,091 | 47,184 | 66,952 | 64,439 | 56,714 | 71,699 | 63,315 | 78,596 | 74,559 |
| Girls' Soccer | Total | 182,938 | 225,560 | 211,056 | 185,594 | 179,509 | 180,254 | 222,679 | 190,382 | 227,172 | 217,546 | 209,027 | 190,436 | 242,602 | 227,951 | 118,608 | 133,171 | 168,680 | 192,685 | 205,801 |
| | Competition | 121,437 | 145,173 | 141,924 | 118,804 | 129,463 | 124,674 | 145,469 | 141,339 | 167,975 | 158,078 | 142,722 | 146,696 | 152,993 | 140,542 | 73,390 | 77,138 | 118,572 | 132,485 | 130,307 |
| | Practice | 61,501 | 80,387 | 69,132 | 66,790 | 50,046 | 55,580 | 77,210 | 49,043 | 59,197 | 59,468 | 66,305 | 43,740 | 89,609 | 87,409 | 45,218 | 56,033 | 50,108 | 60,200 | 75,494 |
| Girls' Volleyball | Total | 78,298 | 79,592 | 71,791 | 53,413 | 67,204 | 50,711 | 52,662 | 44,064 | 45,144 | 46,807 | 58,127 | 46,601 | 67,163 | 59,370 | 54,665 | 61,279 | 68,994 | 73,903 | 60,718 |
| | Competition | 32,177 | 27,076 | 25,898 | 18,204 | 21,550 | 21,416 | 24,439 | 19,150 | 16,430 | 19,373 | 25,300 | 23,886 | 33,075 | 23,045 | 25,810 | 27,437 | 30,805 | 31,391 | 23,122 |
| | Practice | 46,121 | 52,516 | 45,893 | 35,209 | 45,654 | 29,295 | 28,223 | 24,914 | 28,714 | 27,434 | 32,827 | 22,715 | 34,088 | 36,325 | 28,855 | 33,842 | 38,189 | 42,512 | 37,596 |
| Boys' Basketball | Total | 96,966 | 94,482 | 82,580 | 77,897 | 84,102 | 79,762 | 75,872 | 85,819 | 84,455 | 55,980 | 81,240 | 88,927 | 93,773 | 87,521 | 84,828 | 129,429 | 101,263 | 124,110 | 102,434 |
| | Competition | 43,670 | 45,054 | 36,560 | 39,332 | 46,575 | 41,252 | 41,978 | 44,095 | 42,504 | 32,534 | 45,596 | 46,251 | 48,814 | 48,318 | 47,736 | 64,833 | 53,165 | 64,575 | 54,994 |
| | Practice | 53,296 | 49,428 | 46,020 | 38,565 | 37,527 | 38,510 | 33,894 | 41,724 | 41,951 | 23,446 | 35,644 | 42,676 | 44,959 | 39,203 | 37,092 | 64,596 | 48,098 | 59,535 | 47,440 |
| Girls' Basketball | Total | 105,355 | 99,779 | 71,568 | 60,673 | 78,328 | 83,033 | 67,280 | 83,107 | 89,451 | 64,491 | 99,598 | 70,700 | 91,059 | 82,383 | 76,317 | 79,278 | 111,665 | 86,437 | 96,585 |
| | Competition | 53,776 | 52,140 | 43,949 | 34,928 | 44,026 | 53,931 | 37,213 | 45,645 | 50,864 | 38,803 | 56,786 | 44,660 | 54,339 | 48,080 | 43,148 | 37,603 | 51,976 | 58,076 | 68,747 |
| | Practice | 51,579 | 47,639 | 27,619 | 25,745 | 34,302 | 29,102 | 30,067 | 37,462 | 38,587 | 25,688 | 42,812 | 26,040 | 36,720 | 34,303 | 33,169 | 41,675 | 59,689 | 28,361 | 27,838 |
| Boys' Wrestling | Total | 107,654 | 98,836 | 92,353 | 87,041 | 77,857 | 80,569 | 107,992 | 85,485 | 91,203 | 60,253 | 91,642 | 67,834 | 103,058 | 91,176 | 94,606 | 81,045 | 142,959 | 149,885 | 128,822 |
| | Competition | 36,238 | 37,781 | 40,260 | 37,074 | 36,704 | 36,536 | 40,235 | 35,016 | 39,378 | 32,728 | 38,430 | 34,405 | 48,770 | 44,433 | 41,914 | 29,360 | 64,629 | 73,599 | 62,263 |
| | Practice | 71,416 | 61,055 | 52,093 | 49,967 | 41,153 | 44,033 | 67,757 | 50,469 | 51,825 | 27,525 | 53,212 | 33,429 | 54,288 | 46,743 | 52,692 | 51,685 | 78,330 | 76,286 | 66,559 |


| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boys' Baseball | Total | 67,064 | 60,689 | 46,078 | 39,869 | 64,053 | 46,797 | 43,590 | 49,747 | 62,493 | 44,208 | 44,760 | 36,395 | 49,716 | 52,889 | 13,087 | 70,377 | 63,115 | 70,685 | 74,776 |
| | Competition | 33,009 | 33,746 | 22,803 | 25,584 | 36,502 | 29,789 | 20,818 | 24,807 | 37,682 | 27,129 | 25,581 | 21,458 | 26,844 | 30,158 | 833 | 36,233 | 29,855 | 36,455 | 43,526 |
| | Practice | 34,055 | 26,943 | 23,275 | 14,285 | 27,551 | 17,008 | 22,772 | 24,940 | 24,811 | 17,079 | 19,179 | 14,937 | 22,872 | 22,731 | 12,254 | 34,144 | 33,260 | 34,230 | 31,250 |
| Girls' Softball | Total | 63,162 | 54,411 | 61,196 | 49,595 | 67,274 | 52,700 | 91,053 | 58,124 | 53,649 | 43,792 | 65,572 | 69,932 | 76,391 | 66,019 | 14,802 | 54,154 | 76,031 | 85,864 | 74,921 |
| | Competition | 34,544 | 32,191 | 32,909 | 28,452 | 30,767 | 26,607 | 45,091 | 35,477 | 21,096 | 23,993 | 38,713 | 31,561 | 38,445 | 33,975 | 4,758 | 27,285 | 29,914 | 41,385 | 37,614 |
| | Practice | 28,618 | 22,220 | 28,287 | 21,143 | 36,507 | 26,093 | 45,962 | 22,647 | 32,553 | 19,799 | 26,859 | 38,371 | 37,946 | 32,044 | 10,044 | 26,869 | 46,117 | 44,479 | 37,307 |

* COVID-19 may have affected these results.

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## Table 13.3 Body Site of Injury by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body Site** | | | | | | | | | | | | | | | | | | | |
| Ankle | 22.6% | 19.8% | 18.6% | 16.3% | 17.7% | 17.7% | 16.1% | 15.5% | 16.9% | 15.1% | 16.6% | 17.8% | 17.8% | 18.3% | 19.6% | 19.1% | 17.6% | 18.0% | 18.4% |
| Arm/Elbow | 4.1% | 3.9% | 4.7% | 4.2% | 4.1% | 3.1% | 4.0% | 3.5% | 3.1% | 3.7% | 3.4% | 3.7% | 4.6% | 3.5% | 4.0% | 4.0% | 4.2% | 3.6% | 3.6% |
| Foot | 4.4% | 4.3% | 4.2% | 5.2% | 4.2% | 4.0% | 3.4% | 3.2% | 2.8% | 3.9% | 3.6% | 2.5% | 3.9% | 3.9% | 3.6% | 2.5% | 4.7% | 3.6% | 4.6% |
| Hand/Wrist | 9.2% | 8.1% | 10.2% | 9.4% | 10.2% | 8.9% | 8.6% | 7.4% | 7.8% | 7.4% | 7.8% | 7.7% | 9.1% | 7.9% | 8.4% | 7.9% | 7.0% | 9.3% | 8.6% |
| Head/Face | 12.4% | 12.6% | 12.5% | 15.1% | 17.2% | 23.3% | 25.1% | 25.7% | 25.3% | 27.4% | 27.3% | 27.2% | 21.4% | 21.4% | 21.1% | 15.6% | 17.8% | 17.5% | 17.4% |
| Hip/Thigh/Upper Leg | 10.9% | 10.7% | 10.3% | 10.4% | 9.2% | 8.3% | 9.8% | 9.5% | 8.7% | 9.0% | 8.0% | 9.0% | 10.3% | 9.9% | 9.9% | 11.8% | 10.5% | 10.1% | 10.4% |
| Knee | 14.3% | 16.4% | 14.5% | 14.7% | 15.6% | 14.2% | 13.4% | 14.8% | 14.4% | 13.7% | 14.9% | 13.4% | 14.1% | 13.8% | 13.3% | 15.5% | 14.9% | 15.2% | 15.3% |
| Lower Leg | 4.7% | 5.4% | 5.8% | 5.9% | 4.7% | 5.0% | 4.5% | 3.9% | 4.9% | 4.0% | 4.3% | 4.4% | 4.7% | 4.2% | 4.1% | 5.2% | 4.3% | 5.8% | 5.4% |
| Neck | 2.1% | 2.0% | 1.8% | 1.9% | 1.9% | 1.8% | 1.7% | 2.3% | 1.2% | 1.9% | 1.3% | 1.4% | 0.9% | 1.5% | 1.5% | 0.9% | 1.1% | 1.6% | 1.1% |
| Other | 1.0% | 2.1% | 2.1% | 2.7% | 2.2% | 2.1% | 2.0% | 2.5% | 2.4% | 2.5% | 2.1% | 2.3% | 2.0% | 2.2% | 2.3% | 1.3% | 1.2% | 1.6% | 2.0% |
| Shoulder | 7.9% | 7.9% | 9.1% | 8.5% | 7.0% | 7.0% | 6.6% | 6.5% | 8.5% | 7.2% | 6.8% | 6.4% | 6.1% | 7.7% | 7.0% | 7.5% | 7.1% | 7.5% | 6.9% |
| Systemic | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 3.9% | 4.3% | 1.0% | 1.1% |
| Trunk | 6.2% | 6.9% | 6.4% | 5.6% | 5.9% | 4.7% | 5.0% | 5.2% | 4.1% | 4.3% | 4.0% | 4.3% | 5.1% | 5.7% | 5.2% | 4.7% | 5.1% | 5.2% | 5.2% |
| ***Total*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** |

* Throughout this chapter, n's represent the total 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. Totals are not always equal to 100% due to slight rounding or missing responses. Systemic was added in the 2020/21 academic year. COVID-19 may have affected these results.

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**Table 13.4 Injury Diagnosis by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years ***

| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Diagnosis** | | | | | | | | | | | | | | | | | | | |
| Strain/Sprain | 52.2% | 48.2% | 48.3% | 45.8% | 44.9% | 43.2% | 42.2% | 42.3% | 41.7% | 39.8% | 40.4% | 40.2% | 45.1% | 44.6% | 45.3% | 47.8% | 44.2% | 46.8% | 45.8% |
| Contusion | 12.3% | 13.7% | 12.7% | 11.7% | 14.2% | 9.6% | 10.8% | 10.6% | 9.4% | 9.3% | 9.2% | 9.6% | 10.2% | 11.1% | 8.1% | 9.2% | 10.3% | 11.2% | 10.3% |
| Fracture | 9.7% | 9.0% | 10.2% | 10.8% | 9.6% | 10.2% | 7.7% | 7.8% | 7.6% | 9.4% | 8.6% | 8.5% | 8.0% | 7.9% | 7.6% | 8.9% | 7.7% | 9.1% | 9.0% |
| Concussion | 9.3% | 8.4% | 9.2% | 11.5% | 14.0% | 20.0% | 22.2% | 23.1% | 21.9% | 24.6% | 24.6% | 24.8% | 18.8% | 18.8% | 18.0% | 12.3% | 15.2% | 14.8% | 15.1% |
| Other | 16.5% | 20.7% | 19.6% | 20.1% | 17.3% | 17.0% | 17.1% | 16.2% | 19.4% | 16.9% | 17.1% | 16.9% | 17.9% | 17.5% | 21.0% | 21.9% | 22.7% | 18.1% | 19.8% |
| ***Total*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** |

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

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## Table 13.5 Most Common Injury Diagnoses by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Diagnosis** | | | | | | | | | | | | | | | | | | | |
| Ankle Strain/Sprain | 20.6% | 17.8% | 17.4% | 15.0% | 16.1% | 16.3% | 14.7% | 14.5% | 15.6% | 14.2% | 15.7% | 16.5% | 16.4% | 16.2% | 17.7% | 18.0% | 15.9% | 17.0% | 16.3% |
| Hand/Wrist Fracture | 3.5% | 3.6% | 4.0% | 3.9% | 4.2% | 4.0% | 3.7% | 3.2% | 3.3% | 3.5% | 3.6% | 3.5% | 3.4% | 3.5% | 3.4% | 3.7% | 3.1% | 3.7% | 3.4% |
| Hand/Wrist Strain/Sprain | 3.6% | 2.7% | 4.0% | 3.0% | 2.8% | 2.8% | 3.0% | 2.5% | 2.8% | 1.9% | 2.5% | 2.0% | 3.5% | 2.6% | 3.3% | 2.7% | 2.3% | 3.5% | 3.1% |
| Head/Face Concussion | 9.2% | 8.4% | 9.2% | 11.5% | 13.9% | 20.0% | 22.2% | 23.1% | 21.9% | 24.5% | 24.6% | 24.8% | 18.7% | 18.8% | 18.0% | 12.4% | 15.2% | 14.8% | 15.1% |
| Hip/Thigh/Upper Leg Strain/Sprain | 8.0% | 7.7% | 7.3% | 7.8% | 6.5% | 6.4% | 6.9% | 6.7% | 6.6% | 6.9% | 5.7% | 6.4% | 8.1% | 7.2% | 7.5% | 9.2% | 8.2% | 7.1% | 8.0% |
| Knee Other | 4.5% | 4.8% | 4.6% | 4.4% | 5.1% | 4.8% | 3.9% | 4.1% | 4.7% | 4.5% | 5.2% | 4.9% | 5.1% | 4.9% | 4.8% | 6.0% | 5.2% | 5.1% | 6.1% |
| Knee Strain/Sprain | 7.6% | 8.7% | 7.7% | 7.9% | 7.9% | 7.7% | 7.6% | 8.2% | 7.8% | 7.3% | 8.1% | 6.9% | 6.6% | 7.2% | 6.5% | 7.4% | 7.0% | 8.0% | 7.0% |
| Shoulder Other | 3.1% | 3.6% | 4.1% | 4.0% | 3.2% | 3.7% | 3.1% | 3.4% | 4.6% | 4.0% | 3.3% | 3.4% | 2.9% | 3.4% | 4.0% | 3.9% | 3.9% | 4.2% | 3.5% |
| Shoulder Strain/Sprain | 3.4% | 2.8% | 3.5% | 3.8% | 2.9% | 2.2% | 2.9% | 2.6% | 3.3% | 2.6% | 2.9% | 2.7% | 2.8% | 3.6% | 2.6% | 2.9% | 3.0% | 3.1% | 3.0% |
| Trunk Strain/Sprain | 2.9% | 2.8% | 3.2% | 2.7% | 2.6% | 2.4% | 1.9% | 2.3% | 1.7% | 1.9% | 1.5% | 1.9% | 2.6% | 3.2% | 2.3% | 2.7% | 2.1% | 2.8% | 2.6% |

* COVID-19 may have affected these results.

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## Table 13.6 Time Loss of Injuries by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Time Loss** | | | | | | | | | | | | | | | | | | | |
| 1-2 Days | 21.8% | 26.2% | 22.1% | 13.6% | 14.7% | 12.8% | 15.9% | 12.6% | 14.9% | 11.0% | 16.3% | 12.6% | 21.2% | 19.1% | 17.5% | 17.4% | 16.6% | 18.2% | 19.9% |
| 3-6 Days | 29.2% | 28.1% | 28.1% | 28.2% | 27.3% | 25.2% | 23.3% | 23.6% | 21.8% | 22.0% | 21.9% | 22.0% | 20.9% | 22.5% | 22.4% | 22.5% | 22.7% | 22.5% | 22.8% |
| 7-9 Days | 14.9% | 14.5% | 15.4% | 17.5% | 16.1% | 16.7% | 16.1% | 16.3% | 16.7% | 15.6% | 12.9% | 16.1% | 12.8% | 13.3% | 15.3% | 12.2% | 14.8% | 14.4% | 13.9% |
| 10-21 Days | 14.7% | 13.9% | 16.2% | 19.5% | 16.9% | 19.2% | 19.6% | 21.3% | 21.1% | 22.1% | 21.1% | 21.6% | 18.8% | 21.0% | 20.2% | 18.7% | 20.4% | 19.9% | 18.7% |
| >21 Days | 6.6% | 6.9% | 8.9% | 13.6% | 7.9% | 6.9% | 7.0% | 7.7% | 7.3% | 8.9% | 7.7% | 7.8% | 6.5% | 5.6% | 6.3% | 5.0% | 7.0% | 5.6% | 6.6% |
| Other | 12.9% | 10.4% | 9.4% | 7.5% | 17.1% | 19.2% | 18.0% | 18.5% | 18.2% | 20.5% | 20.0% | 20.0% | 19.8% | 18.6% | 18.4% | 24.2% | 18.6% | 19.5% | 18.2% |
| ***Total*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** |

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

## Table 13.7 Injuries Requiring Surgery by Year, High School Sports-Related Injury Surveillance Study, US, 2005-06 to 2023-24 School Years *

| | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Required Surgery | 5.1% | 6.4% | 6.1% | 6.7% | 8.1% | 8.2% | 6.7% | 7.3% | 7.6% | 7.3% | 6.1% | 7.1% | 5.7% | 6.4% | 6.6% | 8.3% | 5.5% | 7.3% | 6.6% |
| Did Not Require Surgery | 94.9% | 93.6% | 93.9% | 93.3% | 91.9% | 91.8% | 93.3% | 92.7% | 92.4% | 92.7% | 93.9% | 92.9% | 94.3% | 93.6% | 93.4% | 91.7% | 94.5% | 92.7% | 93.4% |
| ***Total*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** | ***100.0%*** |

* Totals are not always equal to 100% due to slight rounding or missing responses. COVID-19 may have affected these results.

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## XIV. Reporter Demographics & Compliance

During the 2023-24 school year, 140 ATs enrolled to participate in the study. 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, 130 enrolled ATs reported an average of 40 study weeks. The majority of ATs (84%) reported for more than 20 weeks of the study. Internal validity checks of a 5% randomly selected sample of the 144 schools participating in the convenience sample during the 2022-23 academic year yielded 92.6% sensitivity, 95.8% specificity, a positive predictive value of 73.5%, and a negative predictive value of 99.0%. Internal validity checks are completed every other year. The next internal validity check will occur using data from the 2024-25 academic year.

Prior to the start of the study, participating ATs were asked to complete a short demographics survey. Over three-quarters (81%) of participating high schools were public schools, with the remainder being private. All ATs except for seven provided services to their athletes five or more days each week. 67% of ATs participating during the 2023-24 school year had previously participated in the National High School Sports-Related Injury Surveillance Study.

An online “End of Season” survey gave all participating ATs (both in the original study as well as in the expanded study including those ATs who did not report any data) the opportunity to provide feedback on their experiences with the study. This survey was completed by 104 ATs (74%). Average reporting time burdens were 21 minutes for the weekly exposure report and 8 minutes for the injury report form. Using a 5-point Likert scale, RIO was overwhelmingly reported to be either very easy (67%) or somewhat easy (27%) to use (5 and 4 on the Likert scale, respectively), with ATs being either very satisfied (66%) or somewhat satisfied (20%) with the system (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 2024-25 school year.

## XV. 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 or 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 nationally representative 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 National High School Sports-Related Injury Surveillance Study, 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 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), now known as the Injury Surveillance Program (ISP). Data collected by the NCAA has been used to develop preventive interventions including increased use of protective equipment and rule changes that have had proven success in reducing injuries among collegiate athletes.

For example, NCAA ISP data have 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 time limitations, and a gradual increase in equipment for conditioning and heat acclimation. Additionally, several committees have considered NCAA ISP 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 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. Collins 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 be best 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.