,

CONVENIENCE SAMPLE SUMMARY REPORT

NATIONAL HIGH SCHOOL SPORTS-RELATED INJURY SURVEILLANCE STUDY

2015-2016 School Year

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Note

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

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I. Introduction & Methodology

1.1 Project Overview

To combat the epidemic of obesity among youth in the United States (US), adolescents must be encouraged to get up off the couch and participate in physically active sports, recreation, and leisure activities. Participation in high school sports, one of the most popular physical activities among adolescents, has grown rapidly from an estimated 4.0 million participants in 1971-72 to over 7.8 million in 2014-15. While the health benefits of a physically active lifestyle including participating in sports are undeniable, high school athletes are at risk of sports-related injury because a certain endemic level of injury can be expected among participants of any physical activity. The challenge to injury epidemiologists is to reduce injury rates among high school athletes to the lowest possible level without discouraging adolescents from engaging in this important form of physical activity. This goal can best be accomplished by investigating the etiology of preventable injuries; by developing, implementing, and evaluating protective interventions using such science-based evidence; and by responsibly reporting epidemiologic findings while promoting a physically active lifestyle among adolescents.

1.2 Background and Significance

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

factor data. Previously, no injury surveillance system capable of providing researchers with the needed quality of injury and exposure data for high school sports-related injuries existed.

Since the 2005-06 school year, Dr. R. Dawn Comstock has conducted the National High School Sports-Related Injury Surveillance System to monitor injuries among US high school athletes participating in boys' football, boys' and girls' soccer, boys' and girls' volleyball, boys' and girls' basketball, boys' wrestling, boys' baseball, girls' softball, girls' field hockey, girls' gymnastics, boys' ice hockey, boys' and girls' lacrosse, boys' and girls' swimming & diving, boys' and girls' track & field, boys' and girls' cross country, boys' and girls' tennis, and cheerleading. Due to decreasing numbers of high school participants across the US, boys' volleyball and girls' gymnastics have been dropped from the surveillance. This surveillance has been conducted using the time- and cost-efficient RIO^{TM} (Reporting Information Online) surveillance system. This study during the 2015-16 academic year was funded by the Centers for Disease Control and Prevention (CDC), National Operating Committee on Standards for Athletic Equipment (NOCSAE), and the National Federation of State High School Associations (NFHS).

1.3 Specific Aims

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

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

B) To calculate the rate of injuries per 1,000 athlete-competitions, per 1,000 athlete-practices, and per 1,000 athlete-exposures for US high school athletes in the 22 sports of interest.

C) To provide detailed information about the injuries sustained by US high school athletes including the type, site, severity, initial and subsequent treatment/care, outcome, etc.

D) To provide detailed information about the injury events including athlete demographics, position played, phase of play/activity, etc.

E) To identify potential risk or protective factors.

1.4 Project Design

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

A) An injury that occurred as a result of participation in an organized high school competition, practice, or performance and

B) Required medical attention by a team physician, certified athletic trainer, personal physician, or emergency department/urgent care facility and

C) Resulted in restriction of the high school athlete's participation for one or more days beyond the day of injury and

D) Any fracture, concussion, heat illness, or dental injury regardless of whether or not it resulted in restriction of the student-athlete's participation.

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

A) Number of athlete-practices = the sum of the number of athletes at each practice during the past week. For example, if 20 athletes practiced on Monday through Thursday and 18 practiced on Friday, the number of athlete-practices would equal 98.

B) Number of athlete-competitions = the sum of the number of athletes at each competition during the past week. For example, if 9 athletes played in a Freshman game, 12 in a JV game, and 14 in a Varsity game, the number of athlete-competitions would equal 35.

C) Number of athlete-performances = the sum of the number of cheerleading athletes at each performance during the past week. For example, if 9 cheerleading athletes performed 3 times in one weekend, the number of athlete-performances would equal 27.

1.5 Sample Recruitment

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

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

2) All schools not selected in step 1 who offered any of the more rarely offered 9 sports included in the expansion of the National High School Sports-Related Injury Surveillance Study (girls' field hockey, and lacrosse and boys' ice hockey and lacrosse) were selected for the convenience sample in an attempt to obtain as large a sample as possible reporting for these more rarely offered sports.
3) A random sample of all schools not selected in step 1 or step 2 who offered the remaining sports of interest in the expansion of the National High School Sports-Related Injury Surveillance Study (boys' and girls' track & field, swimming & diving, cross country, and cheerleading) were selected in an attempt to ensure at least 100 schools were reporting for each of the 22 sports of interest.

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

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

School Participation by Sport, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year.*

	# Schools in Random Sample	# Schools in Convenience Sample	# Schools Total
Original Sports			
Football	97	74	171
Boys' Soccer	87	59	146
Girls' Soccer	90	56	146
Girls' Volleyball	93	56	149
Boys' Basketball	99	65	164
Girls' Basketball	99	65	164
Wrestling	86	57	143
Baseball	92	51	143
Softball	96	54	150
New Sports			
Field Hockey	19	23	42
Ice hockey	13	16	29
Boys' Lacrosse	28	38	66
Girls' Lacrosse	27	34	61
Boys' Swimming and Diving	40	53	93
Girls' Swimming and Diving	43	51	94
Boys' Track and Field	69	66	135
Girls' Track and Field	68	68	136
Boys' Cross Country	60	68	128
Girls' Cross Country	60	67	127
Boys' Tennis	47	41	88
Girls' Tennis	49	43	92
Cheerleading	63	62	125
Total	**99**	**104**	**203**

*Numbers only include schools who actually reported data for the 2015-16 school year.

1.6 Data Collection

Each AT that enrolled their school in National High School Sports-Related Injury Surveillance System received an email every Monday throughout the study period reminding them to enter their school's data into the surveillance system. Each participating AT was asked to complete 46 weekly exposure reports: one for each week from July 26, 2015 through June 19, 2016. Exposure reports collected exposure information (number of athlete-competitions and

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

1.7 Data Management

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

1.8 Data Analysis

Data were analyzed using SAS software, version 9.4 and SPSS, version 22.0. Although fractures, concussions, heat illnesses and dental injuries resulting in <1 day time loss were collected, unless otherwise noted, analyses in this report excluded these injuries.

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

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

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

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

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

II. Overall Injury Epidemiology

Table 2.1 Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Overall total	**8,613**	**4,614,770**	**1.87**
Competition	**4,642**	**1,126,046**	**4.12**
Practice	**3,950**	**3,433,387**	**1.15**
Performance	**21**	**55,337**	**0.38**
Boys' football total	3,428	829,506	4.13
Competition	1,945	147,552	13.18
Practice	1,483	681,954	2.17
Boys' soccer total	539	273,811	1.97
Competition	344	84,941	4.05
Practice	195	188,870	1.03
Girls' soccer total	637	242,727	2.62
Competition	448	74,109	6.05
Practice	189	168,618	1.12
Girls' volleyball total	288	246,420	1.17
Competition	120	80,581	1.49
Practice	168	165,839	1.01
Boys' basketball total	546	342,002	1.60
Competition	296	103,451	2.86
Practice	250	238,551	1.05
Girls' basketball total	563	254,742	2.21
Competition	335	78,024	4.29
Practice	228	176,718	1.29
Boys' wrestling total	589	241,675	2.44
Competition	243	60,417	4.02
Practice	346	181,258	1.91
Boys' baseball total	221	258,797	0.85
Competition	131	90,299	1.45
Practice	90	168,498	0.53
Girls' softball total	251	195,189	1.29
Competition	150	68,230	2.20
Practice	101	126,959	0.80
Girls' Field Hockey total	102	70,542	1.45
Competition	48	21,748	2.21
Practice	54	48,794	1.11

Table 2.1 (Continued) Injury Rates by Sport and Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

	# Injuries	# Exposures	Injury rate (per 1,000 AEs)
Boys' Ice Hockey total	111	58,247	1.91
Competition	99	21,849	4.53
Practice	12	36,398	0.33
Boys' Lacrosse total	249	133,189	1.87
Competition	167	39,277	4.25
Practice	82	93,912	0.87
Girls' Lacrosse total	174	99,988	1.74
Competition	100	30,749	3.25
Practice	74	69,239	1.07
Boys' Swimming total	17	89,992	0.19
Competition	3	15,561	0.19
Practice	14	74,431	0.19
Girls' Swimming total	21	97,636	0.22
Competition	4	18,131	0.22
Practice	17	79,505	0.21
Boys' Track total	198	282,910	0.70
Competition	72	53,030	1.36
Practice	126	229,880	0.55
Girls' Track total	215	234,060	0.92
Competition	54	43,963	1.23
Practice	161	190,097	0.85
Cheerleading total	193	282,530	0.68
Competition	16	14,895	1.07
Practice	156	212,298	0.73
Performance	21	55,337	0.38
Boys' Cross Country total	86	139,338	0.62
Competition	16	22,798	0.70
Practice	70	116,540	0.60
Girls' Cross Country total	138	120,413	1.15
Competition	31	19,792	1.57
Practice	107	100,621	1.06

Boys' Tennis total	12	57,629	0.21
Competition	8	17,313	0.46
Practice	4	40,316	0.10
Girls' Tennis total	35	63,427	0.55
Competition	12	19,336	0.62
Practice	23	44,091	0.52

*Only includes injuries resulting in ≥1 days' time loss.

Table 2.2 Proportion of Injuries Resulting in Time Loss, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

	<1 day time loss	≥1 day time loss	Time loss data missing	Total
Overall				
Boys' football	0.7%	94.3%	5.1%	**100%**
Boys' soccer	0.4%	95.9%	3.7%	**100%**
Girls' soccer	0.4%	93.3%	6.3%	**100%**
Girls' volleyball	0.0%	93.8%	6.2%	**100%**
Boys' basketball	0.3%	94.5%	5.2%	**100%**
Girls' basketball	0.3%	91.1%	8.6%	**100%**
Boys' wrestling	0.5%	92.5%	7.1%	**100%**
Boys' baseball	0.9%	96.1%	3.0%	**100%**
Girls' softball	0.4%	94.4%	5.3%	**100%**
Girls' field hockey	0.0%	96.2%	3.8%	**100%**
Boys' ice hockey	0.0%	94.9%	5.1%	**100%**
Boys' lacrosse	0.0%	94.7%	5.3%	**100%**
Girls' lacrosse	0.5%	94.6%	4.9%	**100%**
Boys' swimming	0.0%	94.4%	5.6%	**100%**
Girls' swimming	0.0%	87.5%	12.5%	**100%**
Boys' track	0.0%	96.1%	3.9%	**100%**
Girls' track	0.4%	94.3%	5.3%	**100%**
Cheerleading	0.5%	90.2%	9.3%	**100%**
Boys' cross country	0.0%	96.6%	3.4%	**100%**
Girls' cross country	0.0%	96.5%	3.5%	**100%**
Boys' tennis	0.0%	92.3%	7.7%	**100%**
Girls' tennis	0.0%	100.0%	0.0%	**100%**
Total	**0.5%**	**94.0%**	**5.5%**	**100%**

*By study definition, non-time loss injuries were fractures, concussions, heat illnesses and dental injuries. Because they accounted for less than 1% of all injuries, they are not included in any other analyses.

Table 2.3 Demographic Characteristics of Injured Athletes by Sex, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

	Male	Female
Year in School	**n=5,711**	**n=2,507**
Freshman	22.4%	26.6%
Sophomore	25.2%	27.2%
Junior	24.0%	23.8%
Senior	28.4%	22.5%
Total†	**100%**	**100%**
Age (years)		
Minimum	12	13
Maximum	19	19
Mean (St. Dev.)	15.9 (1.3)	15.7 (1.2)
BMI		
Minimum	11.3	15.6
Maximum	53.2	42.9
Mean (St. Dev.)	24.9 (4.7)	22.3 (3.5)

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

Figure 2.1 Injury Diagnosis by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

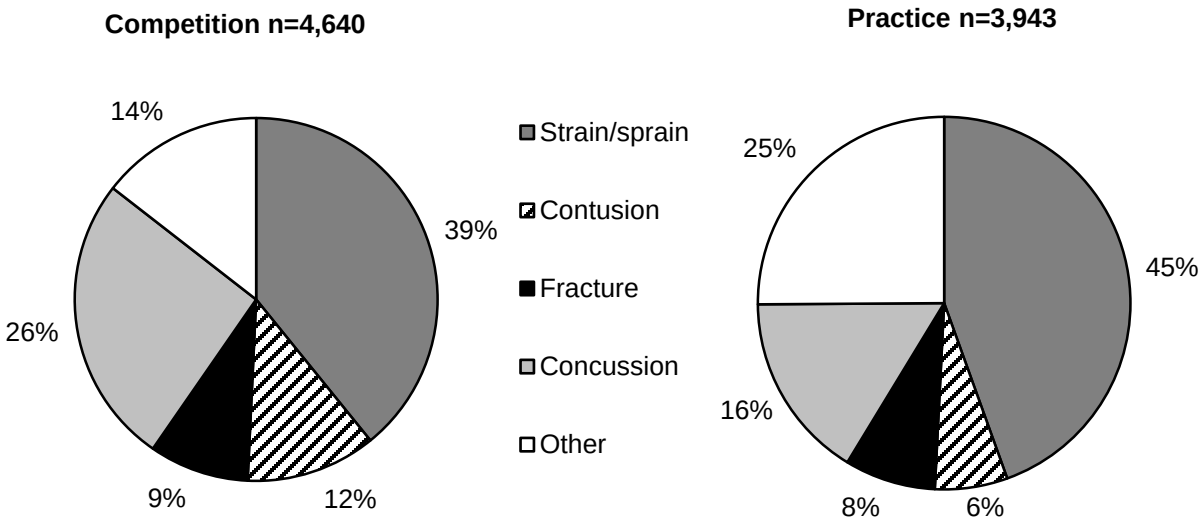


Table 2.4 Body Site of Injury by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall*	
	n	%	n	%	n	%
Body Site						
Head/face	1309	28.2%	738	18.7%	2052	23.8%
Ankle	722	15.6%	613	15.5%	1340	15.6%
Knee	686	14.8%	507	12.8%	1196	13.9%
Hip/thigh/upper leg	363	7.8%	496	12.6%	863	10.0%
Shoulder	357	7.7%	317	8.0%	675	7.8%
Hand/wrist	347	7.5%	274	6.9%	622	7.2%
Lower leg	191	4.1%	266	6.7%	457	5.3%
Trunk	196	4.2%	244	6.2%	440	5.1%
Foot	171	3.7%	139	3.5%	310	3.6%
Arm/elbow	132	2.8%	176	4.5%	308	3.6%
Neck	60	1.3%	64	1.6%	124	1.4%
Other	104	2.2%	112	2.8%	218	2.5%
Total	**4,638**	**100.0%**	**3,946**	**100.0%**	**8,605**	**100.0%**

*Overall includes cheerleading performance related injuries however performance injuries do not have an individual column due to them totaling less than 1.0% of all injuries.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.5 Most Commonly Injured Ankle Structures, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Male		Female		Total	
	n	% of ankle injuries	n	% of ankle injuries	n	% of ankle injuries
Ankle Ligament						
Anterior talofibular ligament	587	73.9%	380	74.5%	967	74.2%
Calcaneofibular ligament	222	28.0%	158	31.0%	380	29.1%
Anterior tibiofibular ligament	193	24.3%	91	17.8%	284	21.8%
Posterior talofibular ligament	94	11.8%	63	12.4%	157	12.0%
Deltoid ligament	64	8.1%	22	4.3%	86	6.6%
Posterior tibiofibular ligament	45	5.7%	27	5.3%	72	5.5%
Total Ankle Injuries	**794**		**510**		**1,304**	

*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.6 Most Commonly Injured Knee Structures, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Male		Female		Total	
	n	% of knee injuries	n	% of knee injuries	n	% of knee injuries
Knee Ligament						
Medial collateral ligament	256	32.3%	83	22.3%	339	29.1%
Patella/patellar tendon	177	22.3%	112	30.0%	289	24.8%
Anterior cruciate ligament	146	18.4%	92	24.7%	238	20.4%
Torn cartilage (meniscus)	141	17.8%	82	22.0%	223	19.1%
Lateral collateral ligament	44	5.6%	13	3.5%	57	4.9%
Posterior cruciate ligament	11	1.4%	9	2.4%	20	1.7%
Total Knee Injuries	**792**		**373**		**1165**	

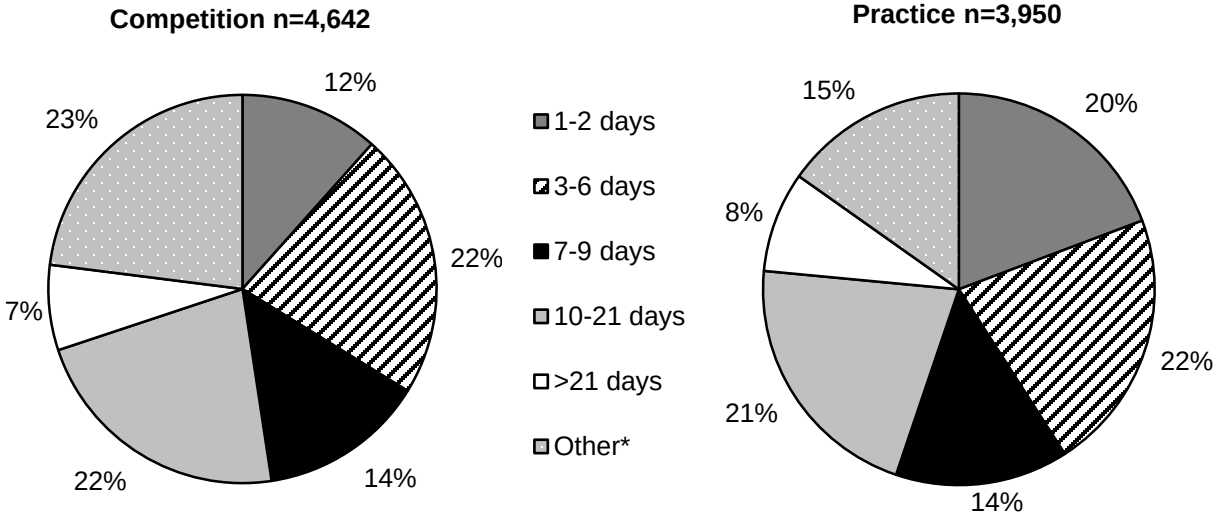
*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 2.7 Ten Most Common Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=4,636		Practice n=3,939		Overall n=8,596	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	1,196	25.8%	635	16.1%	1,836	21.4%
Ankle strain/sprain	691	14.9%	564	14.3%	1,260	14.7%
Hip/thigh/upper leg strain/sprain	226	4.9%	399	10.1%	628	7.3%
Knee strain/sprain	377	8.1%	226	5.7%	605	7.0%
Knee other	216	4.7%	227	5.8%	444	5.2%
Hand/wrist fracture	164	3.5%	136	3.5%	300	3.5%
Shoulder other	163	3.5%	132	3.4%	296	3.4%
Shoulder strain/sprain	154	3.3%	120	3.0%	274	3.2%
Hand/wrist strain/sprain	104	2.2%	111	2.8%	215	2.5%
Trunk strain/sprain	68	1.5%	129	3.3%	197	2.3%

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

Figure 2.2 Time Loss by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall*	
	n	%	n	%	n	%
Need for surgery						
Required surgery	331	7.2%	177	4.5%	511	6.0%
Did not require surgery	4,246	92.8%	3,741	95.5%	8,023	94.0%
Total	**4,595**	**100%**	**3,918**	**100%**	**8,534**	**100%**

*Overall includes cheerleading performance related injuries however performance injuries do not have an individual column due to them totaling less than 1.0% of all injuries.
†Totals and n's are not always equal due to slight rounding or missing responses.

Figure 2.3 New and Recurring Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

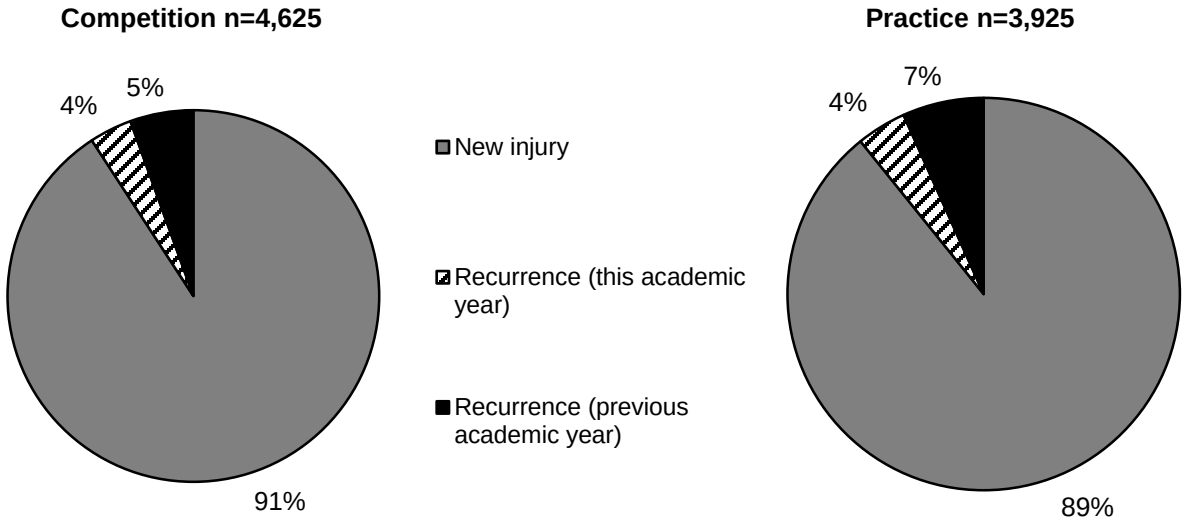


Table 2.9 Time during Season of Injury, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	1,738	20.2%
Regular season	6,549	76.2%
Post season	307	3.6%
Total	**8,594**	**100%**

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

Table 2.10 Practice-Related Variables, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First ½ hour	427	11.4%
Second ½ hour	833	22.2%
1-2 hours into practice	2,166	57.8%
> 2 hours into practice	321	8.6%
Total	**3,747**	**100%**

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

Table 2.11 Methods for Injury Evaluation and Assessment, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
% of Injuries Evaluated by:*		
Certified athletic trainer	8,022	93.1%
General physician	2,014	23.4%
Orthopedic physician	1,808	21.0%
Chiropractor	84	1.0%
Physician's assistant	81	0.9%
Neurologist	53	0.6%
Nurse practitioner	37	0.4%
Dentist/oral surgeon	10	0.1%
Other	168	2.0%
Total	**8,613**	
% of Injuries Assessed by:*		
Evaluation	8,406	97.6%
X-ray	2,884	33.5%
MRI	924	10.7%
CT-scan	216	2.5%
Blood work/lab test	79	0.9%
Other	60	0.7%
Total	**8,613**	

*Multiple responses allowed per injury report.
†Totals and n's are not always equal due to slight rounding or missing responses.

III. Boys' Football Injury Epidemiology

Table 3.1 Football Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**3,428**	**829,506**	**4.13**
Competition	1,945	147,552	13.18
Practice	1,483	681,954	2.17

Table 3.2 Demographic Characteristics of Injured Football Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=3,428**
Freshman	23.2%
Sophomore	24.8%
Junior	24.6%
Senior	27.5%
Total†	**100%**
Age (years)	
Minimum	12
Maximum	19
Mean (St. Dev.)	15.8 (1.2)
BMI	
Minimum	11.3
Maximum	53.2
Mean (SE)	26.0 (5.0)

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

Figure 3.1 Diagnosis of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

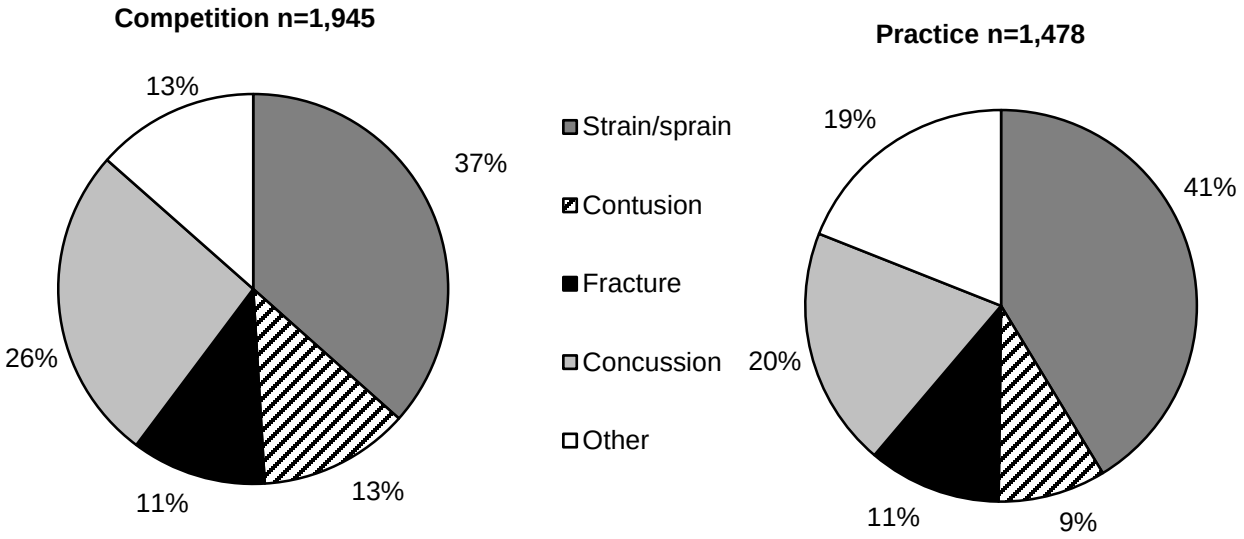


Table 3.3 Body Site of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	526	27.1%	305	20.6%	831	24.3%
Knee	290	14.9%	193	13.0%	483	14.1%
Ankle	235	12.1%	173	11.7%	408	11.9%
Shoulder	197	10.1%	134	9.0%	331	9.7%
Hand/wrist	164	8.4%	173	11.7%	337	9.8%
Hip/thigh/upper leg	122	6.3%	159	10.7%	281	8.2%
Trunk	95	4.9%	89	6.0%	184	5.4%
Lower leg	96	4.9%	61	4.1%	157	4.6%
Arm/elbow	94	4.8%	52	3.5%	146	4.3%
Foot	39	2.0%	43	2.9%	82	2.4%
Neck	35	1.8%	31	2.1%	66	1.9%
Other	51	2.6%	68	4.6%	119	3.5%
Total	**1,944**	**100%**	**1,481**	**100%**	**3,425**	**100%**

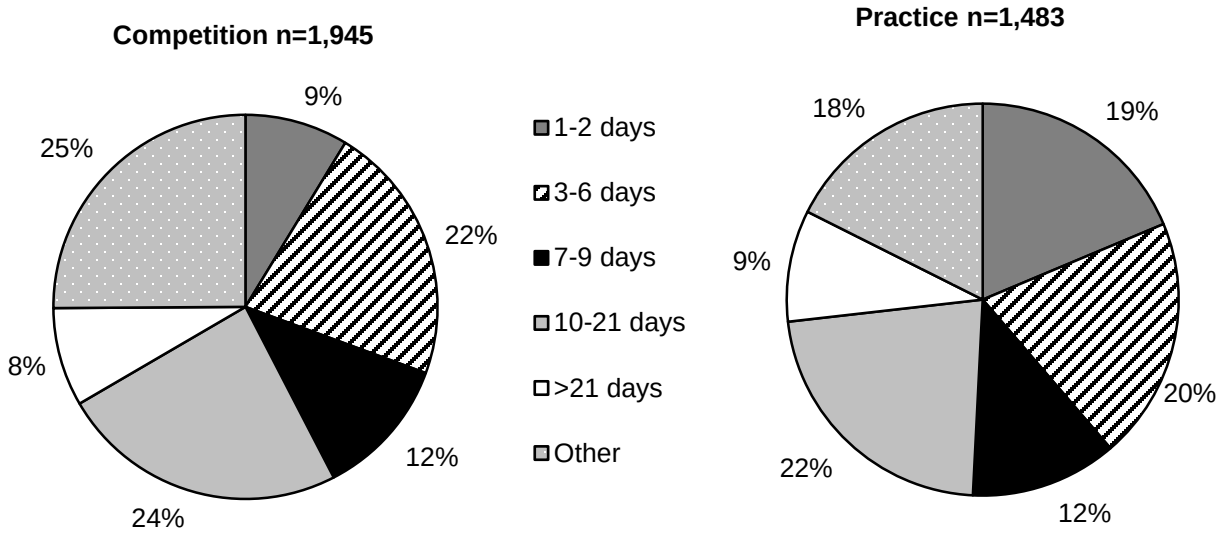
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 3.4 Ten Most Common Football Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=1,944		Practice n=1,476		Total n=3,420	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	510	26.2%	293	19.9%	803	23.5%
Ankle strain/sprain	222	11.4%	161	10.9%	383	11.2%
Knee strain/sprain	191	9.8%	110	7.5%	301	8.8%
Hip/thigh/upper leg strain/sprain	57	2.9%	122	8.3%	179	5.2%
Hand/wrist fracture	82	4.2%	85	5.8%	167	4.9%
Shoulder other	91	4.7%	64	4.3%	155	4.5%
Shoulder strain/sprain	83	4.3%	57	3.9%	140	4.1%
Knee other	64	3.3%	59	4.0%	123	3.6%
Hand/wrist strain/sprain	43	2.2%	53	3.6%	96	2.8%
Hip/thigh/upper leg contusion	55	2.8%	19	1.3%	74	2.2%

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

Figure 3.2 Time Loss of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	162	8.4%	76	5.2%	238	7.0%
Did not require surgery	1,760	91.6%	1,395	94.8%	3,155	93.0%
Total	**1,922**	**100%**	**1,471**	**100%**	**3,393**	**100%**

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

Figure 3.3 History of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

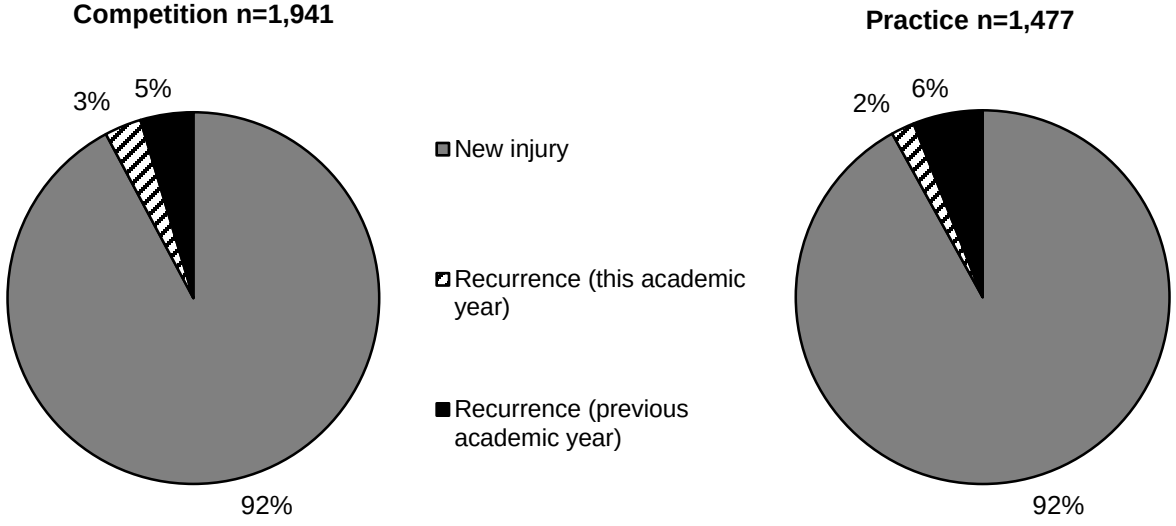


Table 3.6 Time during Season of Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	781	22.8%
Regular season	2,510	73.4%
Post season	130	3.8%
Total	**3,421**	**100%**

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

Table 3.7 Competition-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	17	1.0%
First quarter	197	11.3%
Second quarter	495	28.5%
Third quarter	594	34.2%
Fourth quarter	429	24.7%
Overtime	5	0.3%
Total	**1,737**	**100%**
Field Location		
Between the 20 yard lines	1,310	77.3%
Red zone (20 yard line to goal line)	328	19.4%
End zone	40	2.4%
Off the field	17	1.0%
Total	**1,695**	**100%**

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

Table 3.8 Practice-Related Variables for Football Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	144	10.2%
Second 1/2 hour	258	18.2%
1-2 hours into practice	845	59.6%
>2 hours into practice	170	12.0%
Total	**1,417**	**100%**

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

Figure 3.4 Player Position of Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

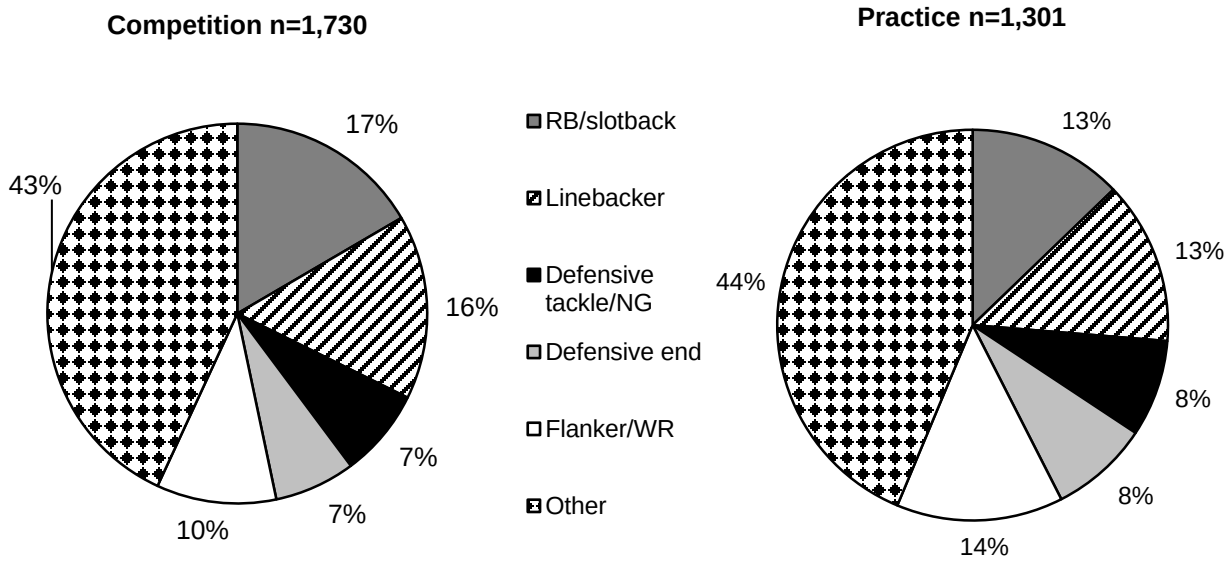


Table 3.9 Activities Leading to Football Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Being tackled	579	32.3%	253	18.4%	832	26.3%
Tackling	447	25.0%	241	17.6%	688	21.8%
Blocking	265	14.8%	237	17.3%	502	15.9%
Being blocked	173	9.7%	118	8.6%	291	9.2%
N/A (e.g., overuse, heat illness, etc.)	34	1.9%	187	13.6%	221	7.0%
Stepped on/fell on/kicked	118	6.6%	70	5.1%	188	5.9%
Rotation around a planted foot/inversion	88	4.9%	83	6.0%	171	5.4%
Contact with ball	4	0.2%	24	1.7%	28	0.9%
Uneven playing surface	6	0.3%	24	1.7%	30	0.9%
Contact with blocking sled/dummy	0	0.0%	23	1.7%	23	0.7%
Contact with goal posts/yard marker/etc.	0	0.0%	0	0.0%	0	0.0%
Other	76	4.2%	112	8.2%	188	5.9%
Total	**1,790**	**100%**	**1,372**	**100%**	**3,162**	**100%**

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

Table 3.10 Activity Resulting in Football Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Being tackled	298	24.2%	112	31.3%	102	29.1%	227	31.4%	92	18.7%
Tackling	187	15.2%	80	22.3%	86	24.5%	222	30.7%	113	22.9%
Blocking	202	16.4%	46	12.8%	57	16.2%	133	18.4%	63	12.8%
Being blocked	89	7.2%	49	13.7%	23	6.6%	97	13.4%	33	6.7%
No contact (overuse/illness)	93	7.6%	3	0.8%	2	0.6%	2	0.3%	121	24.5%
Other	362	29.4%	68	19.0%	81	23.1%	43	5.9%	71	14.4%
Total	**1,231**	**100%**	**358**	**100%**	**351**	**100%**	**724**	**100%**	**493**	**100%**

IV. Boys' Soccer Injury Epidemiology

Table 4.1 Boys' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**539**	**273,811**	**1.97**
Competition	344	84,991	4.05
Practice	195	188,870	1.03

Table 4.2 Demographic Characteristics of Injured Boys' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=520**
Freshman	20.4%
Sophomore	27.9%
Junior	22.3%
Senior	29.4%
Total†	**100%**
Age (years)	
Minimum	12
Maximum	19
Mean (St. Dev.)	15.9 (1.30)
BMI	
Minimum	10.2
Maximum	41.5
Mean (St. Dev.)	22.5 (3.17)

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

Figure 4.1 Diagnosis of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

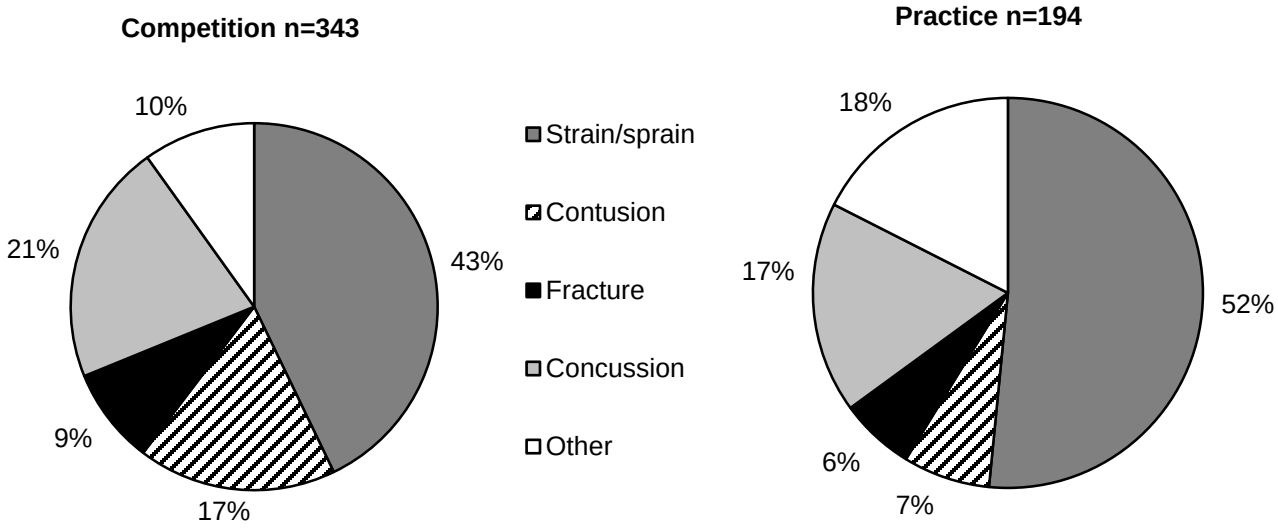


Table 4.3 Body Site of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	84	24.4%	41	21.0%	125	23.2%
Ankle	71	20.6%	31	15.9%	102	18.9%
Hip/thigh/upper leg	45	13.1%	44	22.6%	89	16.5%
Knee	50	14.5%	23	11.8%	73	13.5%
Lower leg	27	7.8%	12	6.2%	39	7.2%
Foot	18	5.2%	14	7.2%	32	5.9%
Hand/wrist	15	4.4%	10	5.1%	25	4.6%
Trunk	12	3.5%	13	6.7%	25	4.6%
Shoulder	9	2.6%	2	1.0%	11	2.0%
Neck	3	0.9%	3	1.5%	6	1.1%
Arm/elbow	3	0.9%	2	1.0%	5	0.9%
Other	7	2.0%	0	0.0%	7	1.3%
Total	**344**	**100.0%**	**195**	**100.0%**	**539**	**100.0%**

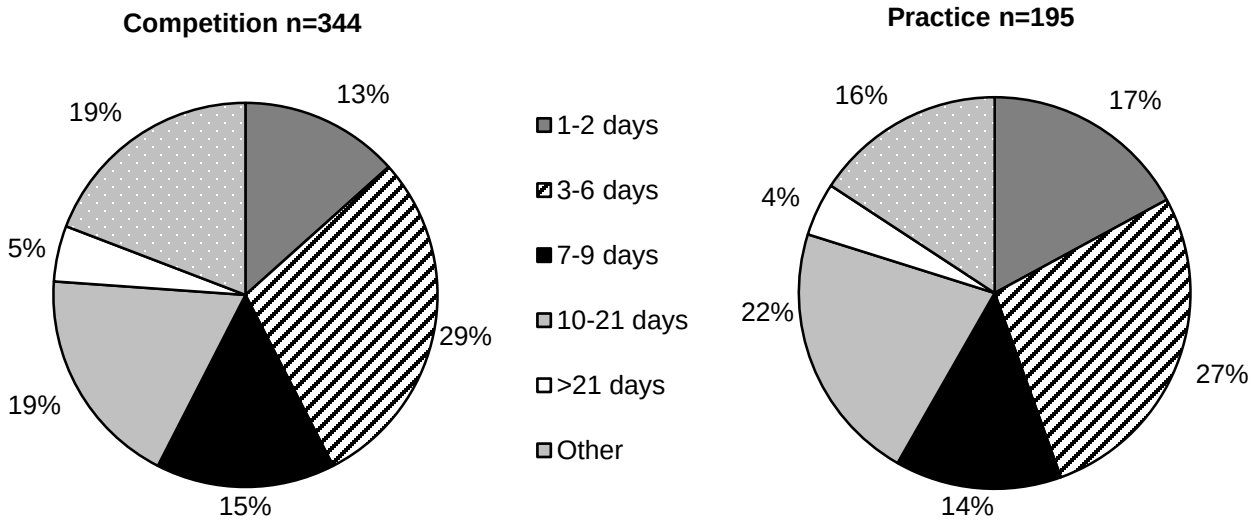
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 4.4 Ten Most Common Boys' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=343		Practice n=194		Total n=537	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	73	21.3%	33	17.0%	106	19.7%
Ankle strain/sprain	68	19.8%	28	14.4%	96	17.9%
Hip/thigh/upper leg strain/sprain	30	8.7%	37	19.1%	67	12.5%
Knee strain/sprain	22	6.4%	11	5.7%	33	6.1%
Knee other	16	4.7%	11	5.7%	27	5.0%
Lower leg strain/sprain	9	2.6%	7	3.6%	16	3.0%
Hip/thigh/upper leg contusion	11	3.2%	4	2.1%	15	2.8%
Lower leg contusion	12	3.5%	2	1.0%	14	2.6%
Trunk strain/sprain	6	1.7%	7	3.6%	13	2.4%
Knee contusion	12	3.5%	1	0.5%	13	2.4%

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

Figure 4.2 Time Loss of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	17	5.0%	5	2.6%	22	4.1%
Did not require surgery	325	95.0%	186	97.4%	511	95.9%
Total	**342**	**100%**	**191**	**100%**	**533**	**100%**

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

Figure 4.3 History of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

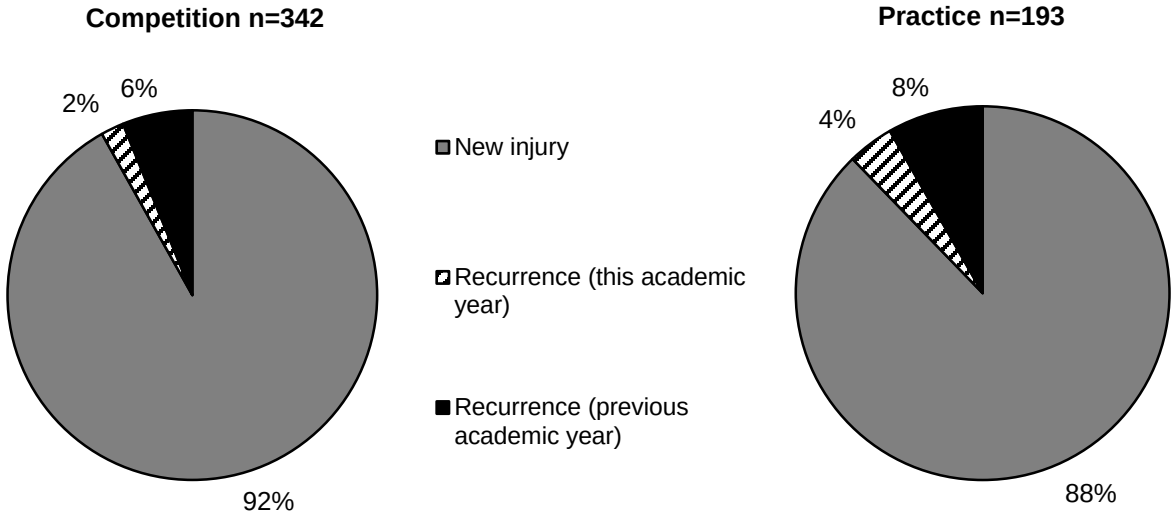


Table 4.6 Time during Season of Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	101	18.7%
Regular season	416	77.2%
Post season	22	4.1%
Total	**539**	**100%**

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

Table 4.7 Competition-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	6	2.0%
First half	90	29.8%
Second half	205	67.9%
Overtime	1	0.3%
Total	**302**	**100%**
Field Location		
Top of goal box extended to center line (offense)	89	29.9%
Top of goal box extended to center line (defense)	65	21.8%
Goal box (defense)	43	14.4%
Goal box (offense)	36	12.1%
Side of goal box (defense)	32	10.7%
Side of goal box (offense)	30	10.1%
Off the field	3	1.0%
Able Total	**298**	**100%**

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

Table 4.8 Practice-Related Variables for Boys' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	21	11.5%
Second 1/2 hour	50	27.3%
1-2 hours into practice	104	56.8%
>2 hours into practice	8	4.4%
Total	**183**	**100%**

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

Figure 4.4 Player Position of Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

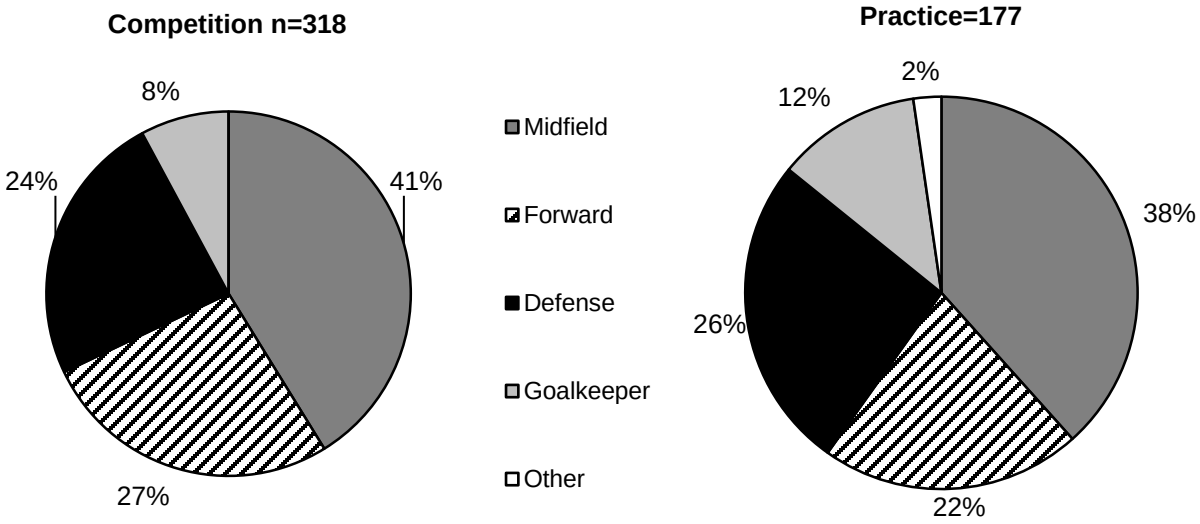


Table 4.9 Activities Leading to Boys' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	70	21.7%	70	38.5%	140	27.8%
Heading ball	40	12.4%	19	10.4%	59	11.7%
Defending	48	14.9%	10	5.5%	58	11.5%
Ball handling/dribbling	31	9.6%	9	4.9%	40	7.9%
Chasing loose ball	36	11.2%	4	2.2%	40	7.9%
Goaltending	22	6.8%	16	8.8%	38	7.5%
Shooting (foot)	20	6.2%	13	7.1%	33	6.5%
Passing (foot)	23	7.1%	10	5.5%	33	6.5%
Receiving pass	18	5.6%	10	5.5%	28	5.6%
Conditioning	0	0.0%	11	6.0%	11	2.2%
Blocking shot	3	0.9%	3	1.6%	6	1.2%
Receiving a slide tackle	5	1.6%	1	0.5%	6	1.2%
Attempting a slide tackle	4	1.2%	1	0.5%	5	1.0%
Other	2	0.6%	5	2.7%	7	1.4%
Total	**322**	**100%**	**182**	**100%**	**504**	**100%**

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

Table 4.10 Activity Resulting in Boys' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	80	34.0%	14	20.6%	7	17.5%	17	17.9%	22	33.8%
Defending	24	10.2%	3	4.4%	3	7.5%	2	2.1%	3	4.6%
Ball handling/ dribbling	28	11.9%	6	8.8%	2	5.0%	0	0.0%	4	6.2%
Chasing loose ball	17	7.2%	7	10.3%	5	12.5%	7	7.4%	4	6.2%
Heading ball	6	2.6%	4	5.9%	1	2.5%	42	44.2%	6	9.2%
Other	80	34.0%	34	50.0%	22	55.0%	27	28.4%	26	40.0%
Total	**235**	**100%**	**68**	**100%**	**40**	**100%**	**95**	**100%**	**65**	**100%**

V. Girls' Soccer Injury Epidemiology

Table 5.1 Girls' Soccer Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**637**	**242,727**	**2.62**
Competition	448	74,109	6.05
Practice	189	168,618	1.12

Table 5.2 Demographic Characteristics of Injured Girls' Soccer Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=616**
Freshman	25.5%
Sophomore	27.8%
Junior	24.7%
Senior	22.1%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.6 (1.2)
BMI	
Minimum	15.6
Maximum	34.4
Mean (St. Dev.)	22.1 (2.9)

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

Figure 5.1 Diagnosis of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

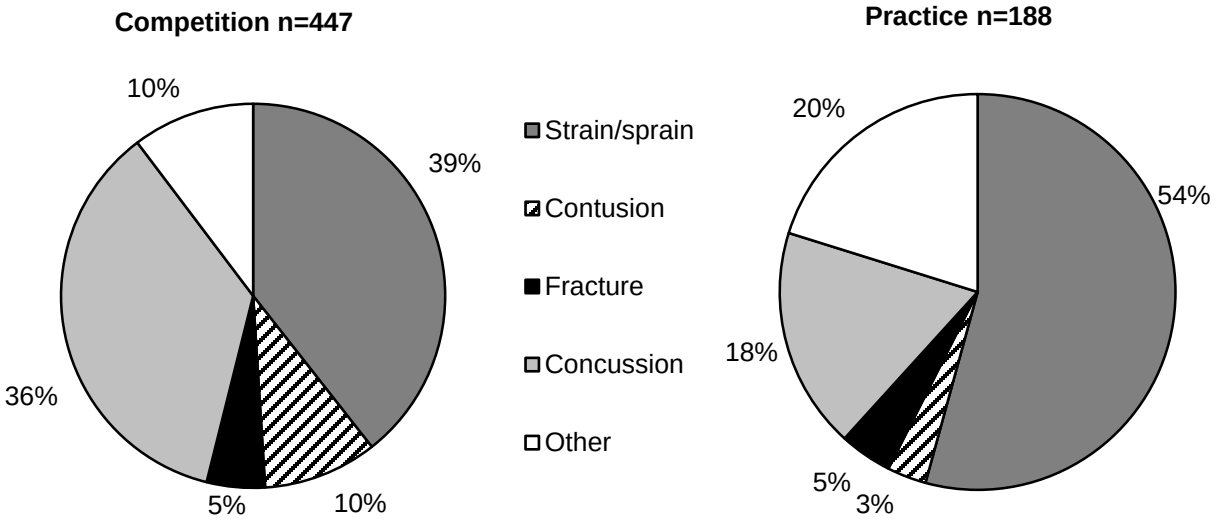


Table 5.3 Body Site of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	170	38.0%	34	18.0%	204	32.1%
Hip/thigh/upper leg	34	7.6%	27	14.3%	61	9.6%
Knee	81	18.1%	30	15.9%	111	17.5%
Ankle	88	19.7%	49	25.9%	137	21.5%
Hand/wrist	10	2.2%	8	4.2%	18	2.8%
Trunk	7	1.6%	11	5.8%	18	2.8%
Lower leg	13	2.9%	12	6.3%	25	3.9%
Foot	26	5.8%	8	4.2%	34	5.3%
Arm/elbow	5	1.1%	2	1.1%	7	1.1%
Shoulder	8	1.8%	3	1.6%	11	1.7%
Neck	0	0.0%	2	1.1%	2	0.3%
Other	5	1.1%	3	1.6%	8	1.3%
Total	**447**	**100%**	**189**	**100%**	**636**	**100%**

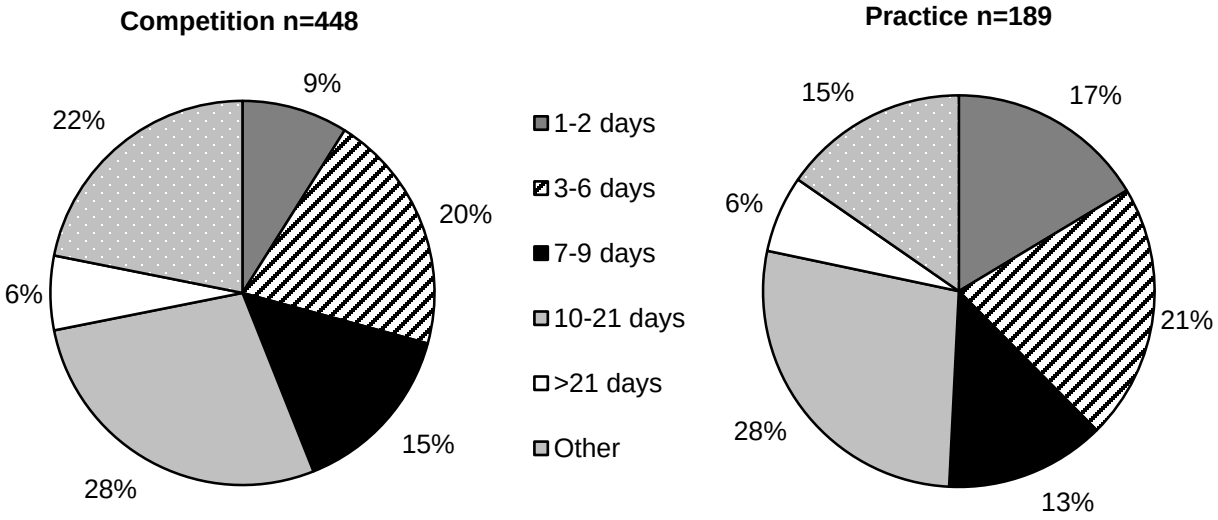
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 5.4 Ten Most Common Girls' Soccer Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=446		Practice n=188		Total n=634	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	160	35.9%	34	18.1%	194	30.6%
Ankle strain/sprain	85	19.1%	45	23.9%	130	20.5%
Knee strain/sprain	45	10.1%	13	6.9%	58	9.1%
Hip/thigh/upper leg strain/sprain	21	4.7%	23	12.2%	44	6.9%
Knee other	25	5.6%	13	6.9%	38	6.0%
Knee contusion	8	1.8%	3	1.6%	11	1.7%
Trunk strain/sprain	4	0.9%	6	3.2%	10	1.6%
Foot strain/sprain	7	1.6%	3	1.6%	10	1.6%
Lower leg other	1	0.2%	8	4.3%	9	1.4%
Foot fracture	6	1.3%	3	1.6%	9	1.4%

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

Figure 5.2 Time Loss of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	30	6.8%	8	4.3%	38	5.9%
Did not require surgery	412	93.2%	180	95.7%	592	94.0%
Total	**442**	**100%**	**188**	**100%**	**630**	**100%**

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

Figure 5.3 History of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

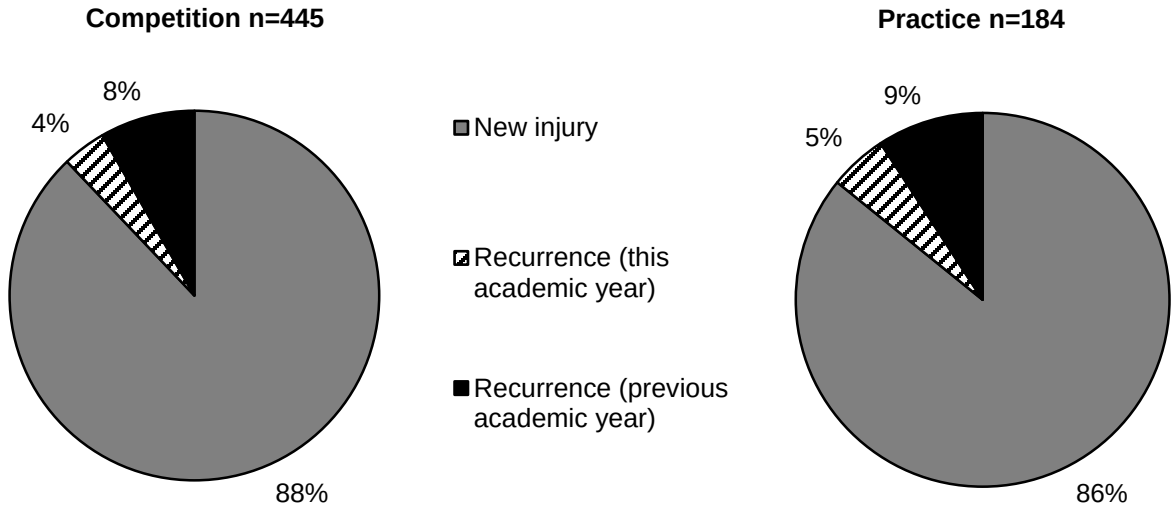


Table 5.6 Time during Season of Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	112	17.6%
Regular season	503	79.0%
Post season	22	3.5%
Total	**637**	**100%**

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

Table 5.7 Competition-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	8	2.0%
First half	145	36.3%
Second half	244	61.2%
Overtime	2	0.5%
Total	**399**	**100%**
Field Location		
Top of goal box extended to center line (offense)	128	32.8%
Top of goal box extended to center line (defense)	85	21.8%
Goal box (defense)	56	14.4%
Side of goal box (defense)	47	12.1%
Side of goal box (offense)	38	9.7%
Goal box (offense)	28	7.2%
Off the field	8	2.1%
Total	**390**	**100%**

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

Table 5.8 Practice-Related Variables for Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	20	10.9%
Second 1/2 hour	49	26.8%
1-2 hours into practice	106	57.9%
>2 hours into practice	8	4.4%
Total	**183**	**100%**

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

Figure 5.4 Player Position of Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

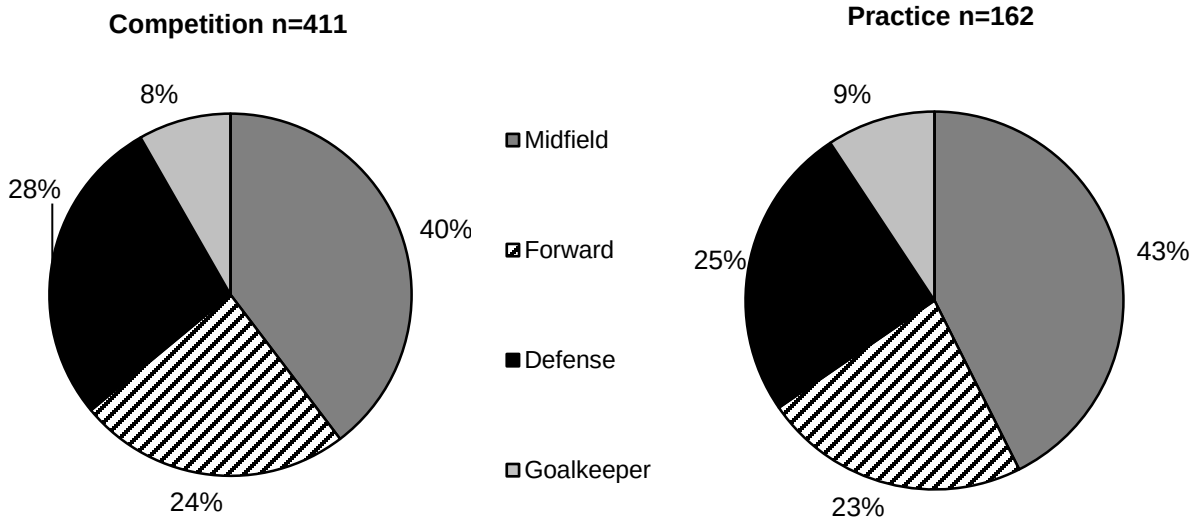


Table 5.9 Activities Leading to Girls' Soccer Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	75	18.3%	51	31.1%	126	22.0%
Defending	63	15.4%	10	6.1%	73	12.7%
Heading ball	52	12.7%	15	9.1%	67	11.7%
Chasing loose ball	45	11.0%	13	7.9%	58	10.1%
Ball handling/dribbling	37	9.0%	10	6.1%	47	8.2%
Goaltending	28	6.8%	14	8.5%	42	7.3%
Passing (foot)	30	7.3%	11	6.7%	41	7.2%
Receiving pass	31	7.6%	6	3.7%	37	6.5%
Shooting (foot)	21	5.1%	10	6.1%	31	5.4%
Conditioning	0	0.0%	17	10.4%	17	3.0%
Blocking shot	14	3.4%	2	1.2%	16	2.8%
Attempting a slide tackle	4	1.0%	2	1.2%	6	1.0%
Receiving a slide tackle	5	1.2%	0	0.0%	5	0.9%
Other	4	1.0%	3	1.8%	7	1.2%
Total	**409**	**100%**	**164**	**100%**	**573**	**100%**

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

Table 5.10 Activity Resulting in Girls' Soccer Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	59	24.0%	12	25.0%	3	11.1%	29	16.5%	23	31.1%
Defending	35	14.2%	4	8.3%	4	14.8%	22	12.5%	8	10.8%
Chasing loose ball	26	10.6%	3	6.3%	5	18.5%	13	7.4%	11	14.9%
Heading ball	1	0.4%	2	4.2%	1	3.7%	62	35.2%	1	1.4%
Ball handling /dribbling	29	11.8%	6	12.5%	3	11.1%	6	3.4%	3	4.1%
Other	96	39.0%	21	43.8%	11	40.7%	44	25.0%	28	37.8%
Total	**246**	**100%**	**48**	**100%**	**27**	**100%**	**176**	**100%**	**74**	**100%**

VI. Girls' Volleyball Injury Epidemiology

Table 6.1 Girls' Volleyball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**288**	**246,420**	**1.17**
Competition	120	80,581	1.49
Practice	168	165,839	1.01

Table 6.2 Demographic Characteristics of Injured Girls' Volleyball Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=275**
Freshman	28.7%
Sophomore	23.6%
Junior	27.6%
Senior	20.0%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.5 (1.2)
BMI	
Minimum	15.8
Maximum	37.0
Mean (St. Dev.)	22.3 (3.4)

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

Figure 6.1 Diagnosis of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

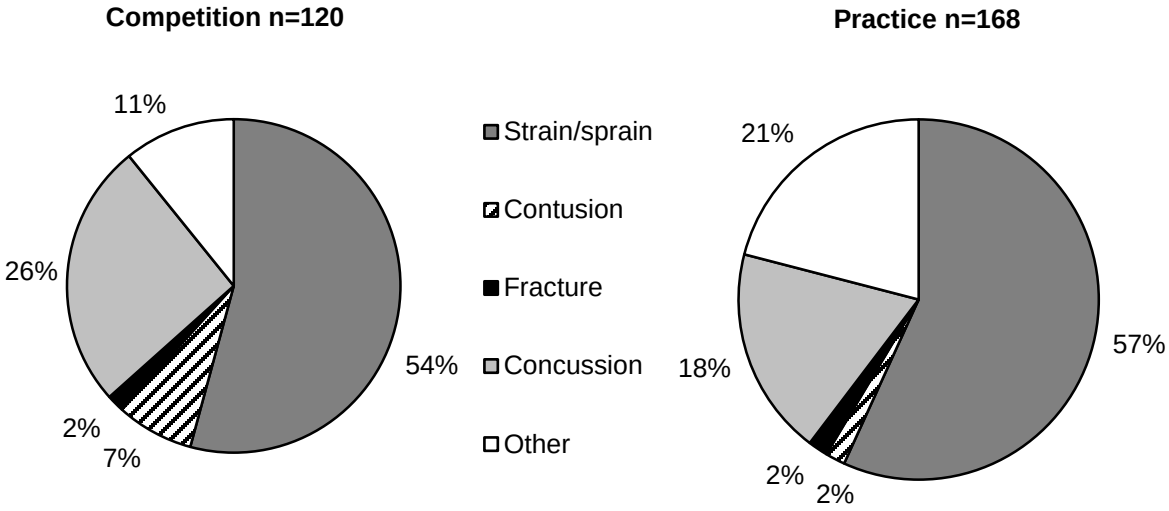


Table 6.3 Body Site of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

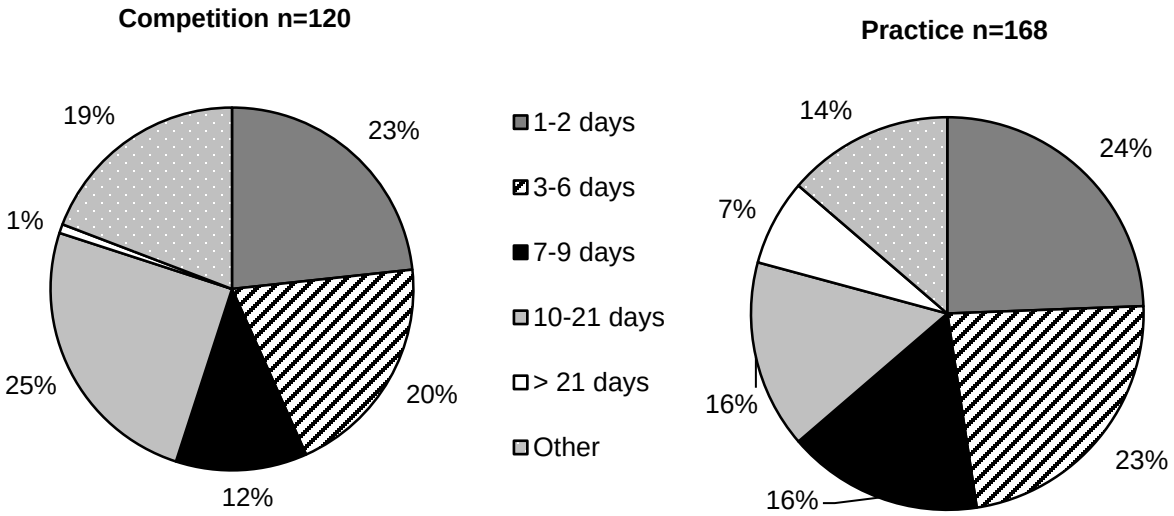
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	35	29.2%	47	28.0%	82	28.5%
Head/face	34	28.3%	35	20.8%	69	24.0%
Hand/wrist	17	14.2%	13	7.7%	30	10.4%
Knee	13	10.8%	15	8.9%	28	9.7%
Shoulder	6	5.0%	15	8.9%	21	7.3%
Trunk	3	2.5%	15	8.9%	18	6.3%
Hip/thigh/upper leg	4	3.3%	10	6.0%	14	4.9%
Foot	3	2.5%	5	3.0%	8	2.8%
Lower leg	1	0.8%	5	3.0%	6	2.1%
Neck	3	2.5%	3	1.8%	6	2.1%
Arm/elbow	1	0.8%	4	2.4%	5	1.7%
Other	0	0.0%	1	0.6%	1	0.3%
Total	**120**	**100%**	**168**	**100%**	**288**	**100%**

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

Table 6.4 Ten Most Common Girls' Volleyball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=120		Practice n=168		Total n=288	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	35	29.2%	43	25.6%	78	27.1%
Head/face concussion	31	25.8%	32	19.0%	63	21.9%
Hand/wrist strain/sprain	11	9.2%	9	5.4%	20	6.9%
Knee other	7	5.8%	7	4.2%	14	4.9%
Shoulder strain/sprain	4	3.3%	9	5.4%	13	4.5%
Hip/thigh/upper leg strain/sprain	4	3.3%	9	5.4%	13	4.5%
Knee strain/sprain	5	4.2%	8	4.8%	13	4.5%
Trunk strain/sprain	2	1.7%	11	6.5%	13	4.5%
Shoulder other	2	1.7%	6	3.6%	8	2.8%
Neck strain/sprain	3	2.5%	3	1.8%	6	2.1%

Figure 6.2 Time Loss of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	4	3.3%	5	4.2%	9	3.8%
Did not require surgery	116	96.7%	161	95.8%	277	96.2%
Total	**120**	**100%**	**166**	**100%**	**286**	**100%**

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

Figure 6.3 History of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

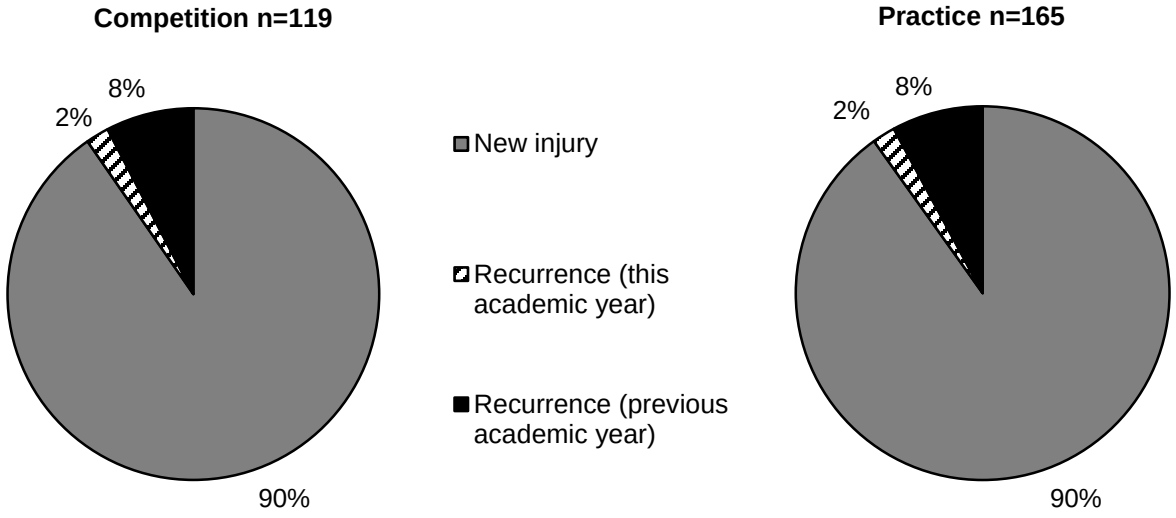


Table 6.6 Time during Season of Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	64	22.3%
Regular season	209	72.8%
Post season	14	4.9%
Total	**287**	**100%**

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

Table 6.7 Competition-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	18	16.8%
First set	11	10.3%
Second set	36	33.6%
Third set	34	31.8%
Fourth set	6	5.6%
Fifth set	2	1.9%
Total	**107**	**100%**
Court Location		
Middle forward	27	26.7%
Right forward	18	17.8%
Left forward	17	16.8%
Left back	16	15.8%
Outside the playable area	9	8.9%
At the net	4	4.0%
Right back (server)	7	6.9%
Outside court (your side)	2	2.0%
Outside court (opponent's side)	1	1.0%
Total	**101**	**100%**

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

Table 6.8 Practice-Related Variables for Girls' Volleyball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	18	11.4%
Second 1/2 hour	35	22.2%
1-2 hours into practice	91	57.6%
>2 hours into practice	14	8.9%
Total	**158**	**100%**

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

Figure 6.4 Player Position of Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

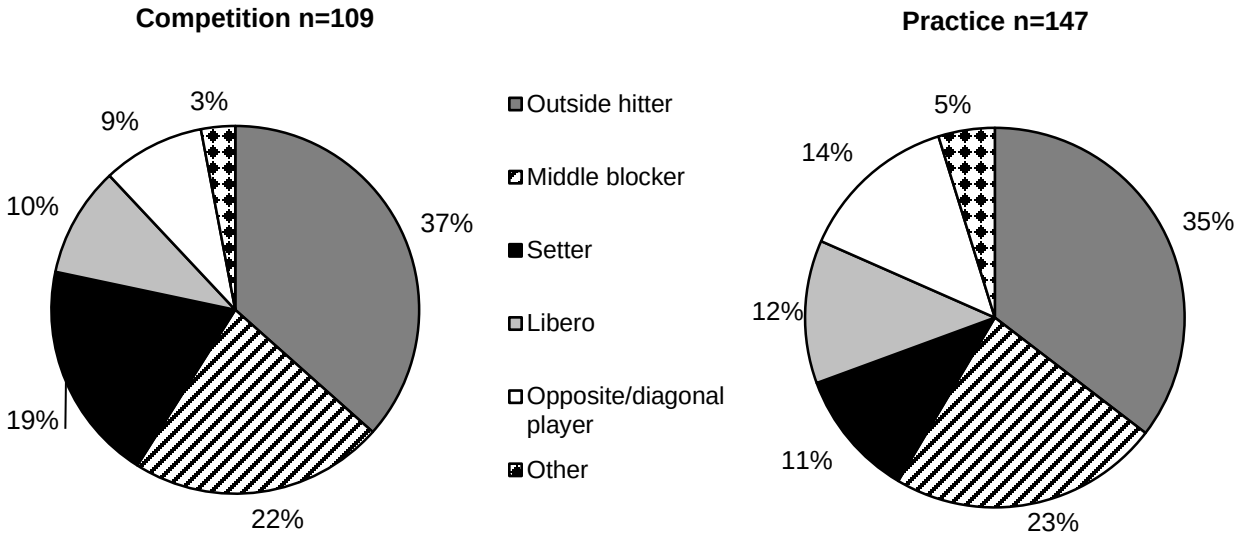


Table 6.9 Activities Leading to Girls' Volleyball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Blocking	32	28.1%	27	17.2%	59	21.8%
General play	16	14.0%	42	26.8%	58	21.4%
Digging	23	20.2%	25	15.9%	48	17.7%
Passing	13	11.4%	15	9.6%	28	10.3%
Spiking	13	11.4%	15	9.6%	28	10.3%
Setting	8	7.0%	10	6.4%	18	6.6%
Serving	3	2.6%	7	4.5%	10	3.7%
Conditioning	0	0.0%	8	5.1%	8	3.0%
Other	6	5.3%	8	5.1%	14	5.2%
Total	**114**	**100%**	**157**	**100%**	**271**	**100%**

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

Table 6.10 Activity Resulting in Girls' Volleyball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	26	17.0%	3	25.0%	1	20.0%	10	17.2%	18	41.9%
Blocking	49	32.0%	2	16.7%	1	20.0%	2	3.4%	5	11.6%
Digging	15	9.8%	4	33.3%	2	40.0%	21	36.2%	6	14.0%
Spiking	15	9.8%	1	8.3%	0	0.0%	7	12.1%	5	11.6%
Passing	16	10.5%	0	0.0%	0	0.0%	7	12.1%	5	11.6%
Other	32	20.9%	2	16.7%	1	20.0%	11	19.0%	4	9.3%
Total	**153**	**100%**	**12**	**100%**	**5**	**100%**	**58**	**100%**	**43**	**100%**

VII. Boys' Basketball Injury Epidemiology

Table 7.1 Boys' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**546**	**342,002**	**1.60**
Competition	296	103,451	2.86
Practice	250	238,551	1.05

Table 7.2 Demographic Characteristics of Injured Boys' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=529**
Freshman	19.1%
Sophomore	26.8%
Junior	22.7%
Senior	31.4%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.1 (1.2)
BMI	
Minimum	16.5
Maximum	35.7
Mean (St. Dev.)	23.0 (2.9)

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

Figure 7.1 Diagnosis of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

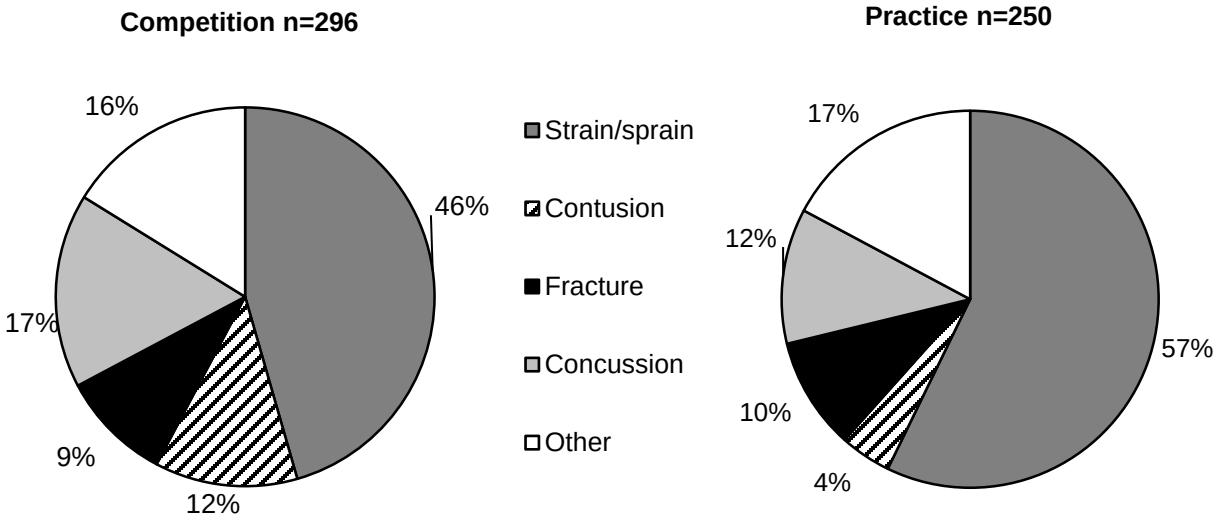


Table 7.3 Body Site of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	83	28.0%	96	38.4%	179	32.8%
Head/face	68	23.0%	37	14.8%	105	19.2%
Knee	46	15.5%	25	10.0%	71	13.0%
Hand/wrist	32	10.8%	18	7.2%	50	9.2%
Hip/thigh/upper leg	18	6.1%	22	8.8%	40	7.3%
Foot	16	5.4%	18	7.2%	34	6.2%
Trunk	11	3.7%	11	4.4%	22	4.0%
Arm/elbow	9	3.0%	5	2.0%	14	2.6%
Lower leg	2	0.7%	10	4.0%	12	2.2%
Shoulder	9	3.0%	3	1.2%	12	2.2%
Other	2	0.7%	5	2.0%	7	1.3%
Total	**296**	**100%**	**250**	**100%**	**546**	**100%**

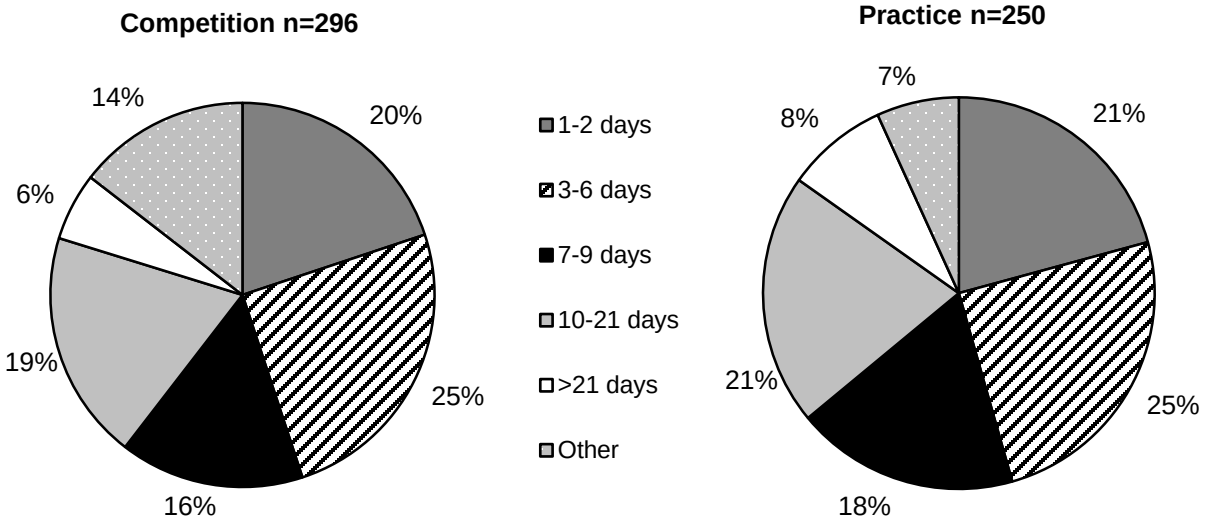
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 7.4 Ten Most Common Boys' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=296		Practice n=250		Total n=546	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	82	27.7%	90	36.0%	172	31.5%
Head/face concussion	49	16.6%	29	11.6%	78	14.3%
Knee other	17	5.7%	12	4.8%	29	5.3%
Hip/thigh/upper leg strain/sprain	11	3.7%	17	6.8%	28	5.1%
Knee strain/sprain	17	5.7%	10	4.0%	27	4.9%
Hand/wrist strain/sprain	13	4.4%	8	3.2%	21	3.8%
Hand/wrist fracture	11	3.7%	8	3.2%	19	3.5%
Foot strain/sprain	7	2.4%	10	4.0%	17	3.1%
Knee contusion	11	3.7%	2	0.8%	13	2.4%
Trunk contusion	8	2.7%	3	1.2%	11	2.0%

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

Figure 7.2 Time Loss of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	20	6.8%	11	4.4%	31	5.7%
Did not require surgery	274	93.2%	237	95.6%	511	94.3%
Total	**294**	**100%**	**248**	**100%**	**542**	**100%**

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

Figure 7.3 History of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

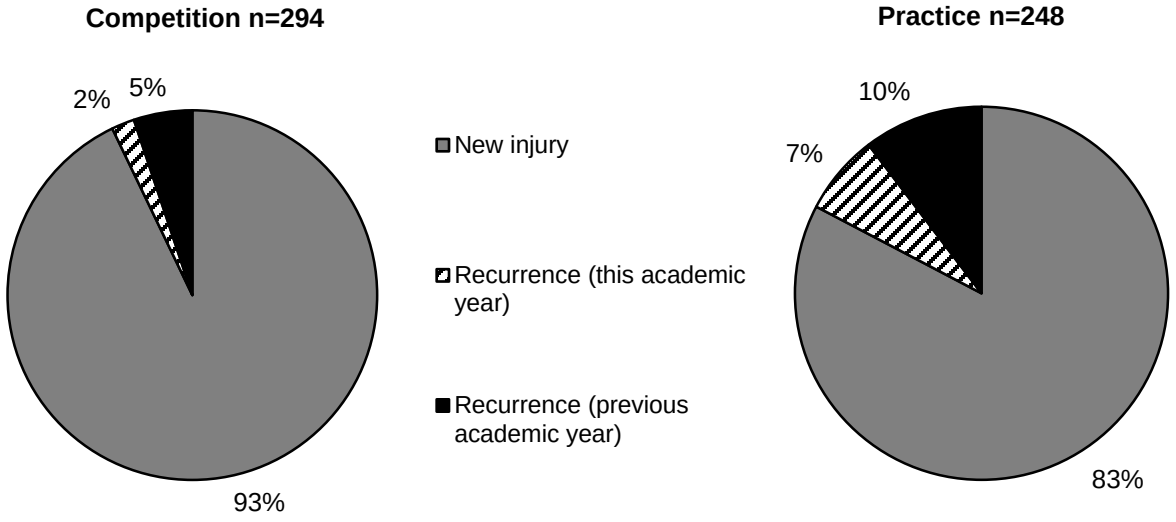


Table 7.6 Time during Season of Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	124	22.7%
Regular season	410	75.1%
Post season	12	2.2%
Total	**546**	**100.0%**

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

Table 7.7 Competition-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition-warm-ups	12	4.4%
First quarter	38	14.1%
Second quarter	76	28.1%
Third quarter	80	29.6%
Fourth quarter	62	23.0%
Overtime	2	0.7%
Total	**270**	**100%**
Court Location		
Inside lane (defense)	82	30.9%
Inside lane (offense)	64	24.2%
Between 3 pt arc and lane (offense)	36	13.6%
Outside 3 point arc - offense	23	8.7%
Between 3 pt arc and lane (defense)	20	7.5%
Outside 3 point arc - defense	14	5.3%
Backcourt	13	4.9%
Off the court	7	2.6%
Out of bounds	6	2.3%
Total	**265**	**100%**

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

Table 7.8 Practice-Related Variables for Boys' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	25	10.3%
Second 1/2 hour	52	21.5%
1-2 hours into practice	149	61.6%
>2 hours into practice	16	6.6%
Total	**242**	**100%**

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

Figure 7.4 Player Position of Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

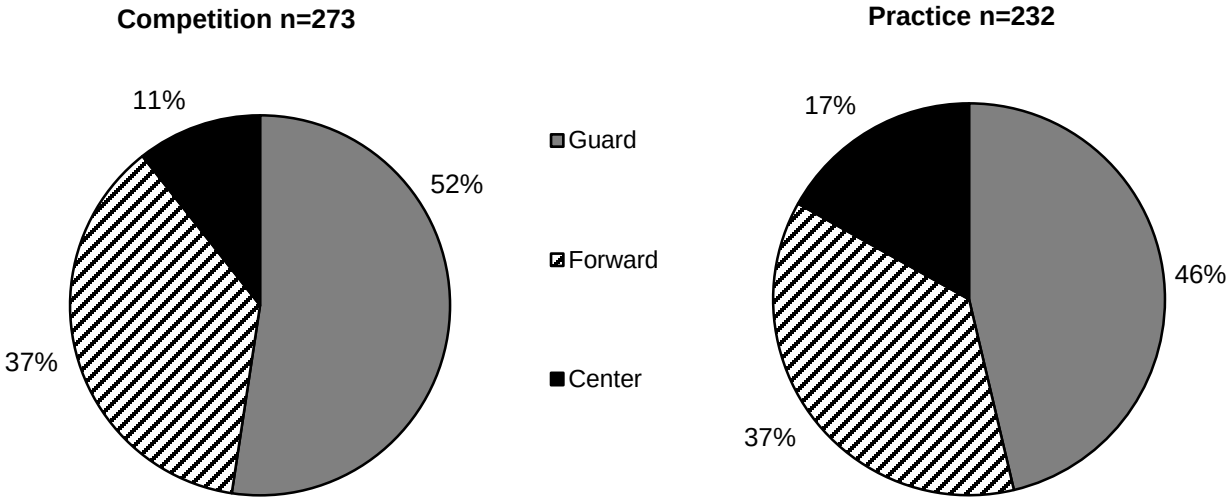


Table 7.9 Activities Leading to Boys' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Rebounding	75	27.7%	59	25.4%	134	26.6%
General play	44	16.2%	63	27.2%	107	21.3%
Defending	45	16.6%	28	12.1%	73	14.5%
Shooting	36	13.3%	28	12.1%	64	12.7%
Chasing loose ball	32	11.8%	16	6.9%	48	9.5%
Ball handling/dribbling	15	5.5%	9	3.9%	24	4.8%
Receiving pass	11	4.1%	6	2.6%	17	3.4%
Other	12	4.4%	5	2.2%	17	3.4%
Conditioning	0	0.0%	13	5.6%	13	2.6%
Passing	0	0.0%	5	2.2%	5	1.0%
Screening	1	0.4%	0	0.0%	1	0.2%
Total	**271**	**100%**	**232**	**100%**	**503**	**100%**

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

Table 7.10 Activity Resulting in Boys' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Rebounding	79	30.7%	9	20.0%	13	27.1%	14	19.7%	19	23.2%
General play	54	21.0%	5	11.1%	10	20.8%	14	19.7%	24	29.3%
Defending	36	14.0%	9	20.0%	6	12.5%	12	16.9%	10	12.2%
Shooting	33	12.8%	11	24.4%	8	16.7%	4	5.6%	8	9.8%
Chasing loose ball	18	7.0%	6	13.3%	2	4.2%	18	25.4%	4	4.9%
Other	37	14.5%	5	11.2%	9	18.7%	9	12.7%	17	20.6%
Total	**257**	**100%**	**45**	**100%**	**48**	**100%**	**71**	**100%**	**82**	**100%**

VIII. Girls' Basketball Injury Epidemiology

Table 8.1 Girls' Basketball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**563**	**254,742**	**2.21**
Competition	335	78,024	4.29
Practice	228	176,718	1.29

Table 8.2 Demographic Characteristics of Injured Girls' Basketball Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=543**
Freshman	27.8%
Sophomore	27.4%
Junior	21.5%
Senior	23.2%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	19
Mean (St. Dev.)	15.7 (1.2)
BMI	
Minimum	16.1
Maximum	42.9
Mean (St. Dev.)	22.5 (3.6)

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

Figure 8.1 Diagnosis of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

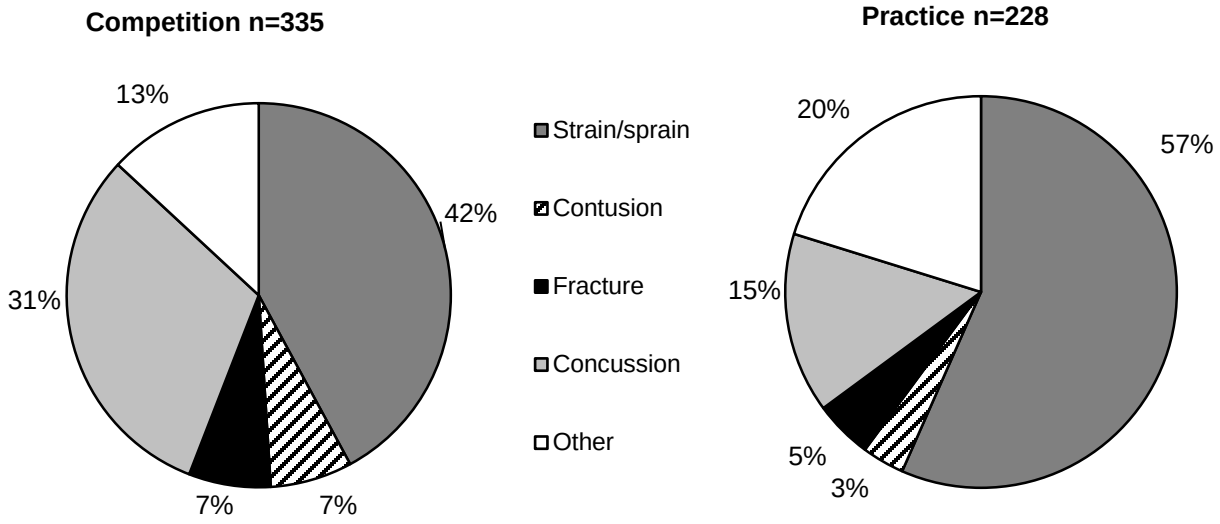


Table 8.3 Body Site of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

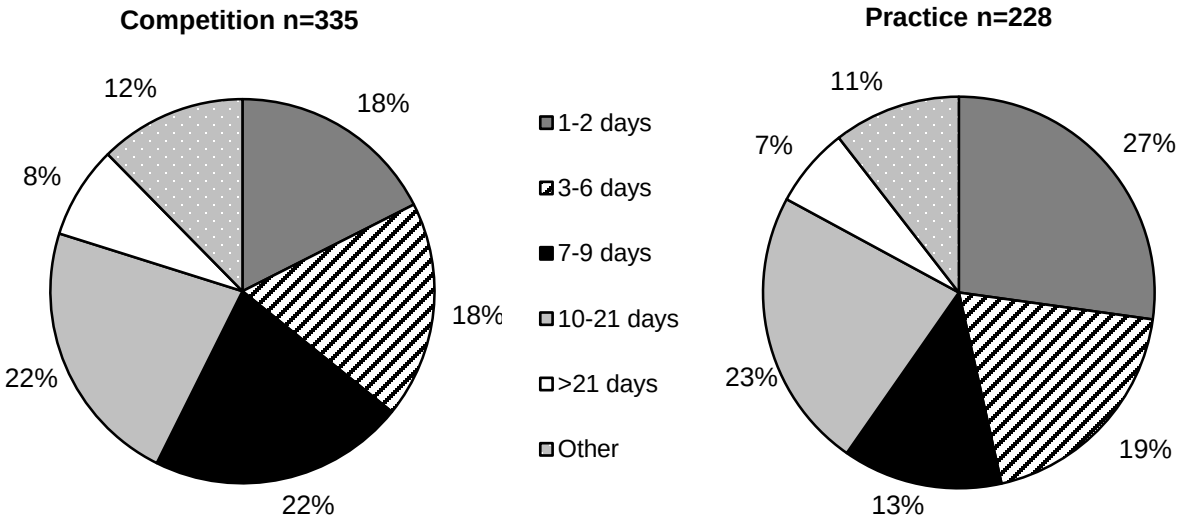
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	113	33.7%	42	18.4%	155	27.5%
Ankle	80	23.9%	67	29.4%	147	26.1%
Knee	68	20.3%	33	14.5%	101	17.9%
Hand/wrist	26	7.8%	18	7.9%	44	7.8%
Hip/thigh/upper leg	12	3.6%	19	8.3%	31	5.5%
Foot	8	2.4%	14	6.1%	22	3.9%
Lower leg	4	1.2%	14	6.1%	18	3.2%
Trunk	6	1.8%	10	4.4%	16	2.8%
Shoulder	12	3.6%	2	0.9%	14	2.5%
Arm/elbow	4	1.2%	1	0.4%	5	0.9%
Neck	0	0.0%	1	0.4%	1	0.2%
Other	2	0.6%	7	3.1%	9	1.6%
Total	**335**	**100%**	**228**	**100%**	**563**	**100%**

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

Table 8.4 Ten Most Common Girls' Basketball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=335		Practice n=228		Total n=563	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	78	23.3%	65	28.5%	143	25.4%
Head/face concussion	104	31.0%	34	14.9%	138	24.5%
Knee strain/sprain	35	10.4%	17	7.5%	52	9.2%
Knee other	27	8.1%	13	5.7%	40	7.1%
Hip/thigh/upper leg sprain/strain	8	2.4%	18	7.9%	26	4.6%
Hand/wrist strain/sprain	8	2.4%	11	4.8%	19	3.4%
Hand/wrist fracture	12	3.6%	5	2.2%	17	3.0%
Foot other	0	0.0%	9	3.9%	9	1.6%
Lower leg other	0	0.0%	8	3.5%	8	1.4%
Shoulder strain/sprain	6	1.8%	2	0.9%	8	1.4%

Figure 8.2 Time Loss of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	N	%
Need for surgery						
Required surgery	30	9.0%	10	4.4%	40	7.2%
Did not require surgery	303	91.0%	216	95.6%	519	92.8%
Total	**333**	**100%**	**226**	**100%**	**559**	**100%**

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

Figure 8.3 History of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

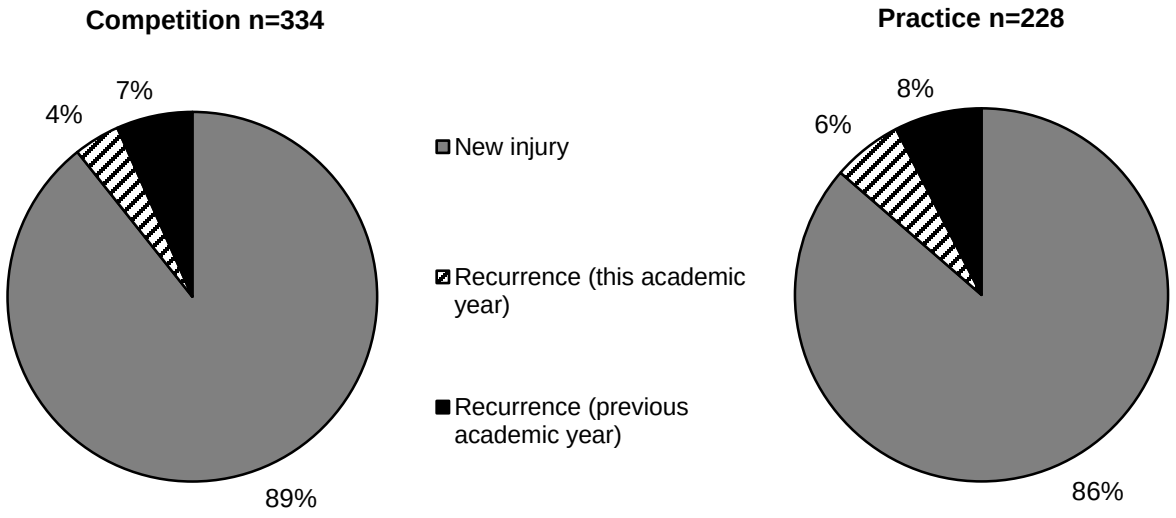


Table 8.6 Time during Season of Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	92	16.4%
Regular season	454	80.9%
Post season	15	2.7%
Total	**516**	**100%**

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

Table 8.7 Competition-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/Warm-ups	6	2.1%
First quarter	31	10.9%
Second quarter	76	26.7%
Third quarter	102	35.8%
Fourth quarter	70	24.6%
Total	**285**	**100%**
Court Location		
Inside lane (offense)	59	20.8%
Inside lane (defense)	67	23.7%
Between 3 point arc and lane (defense)	39	13.8%
Between 3 point arc and lane (offense)	36	12.7%
Outside 3 point arc - offense	34	12.0%
Outside 3 point arc - defense	33	11.7%
Backcourt	9	3.2%
Out of bounds	4	1.4%
Off the court	2	0.7%
Total	**283**	**100%**

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

Table 8.8 Practice-Related Variables for Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	30	13.5%
Second 1/2 hour	52	23.3%
1-2 hours into practice	123	55.2%
>2 hours into practice	18	8.1%
Total	**223**	**100%**

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

Figure 8.4 Player Position of Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

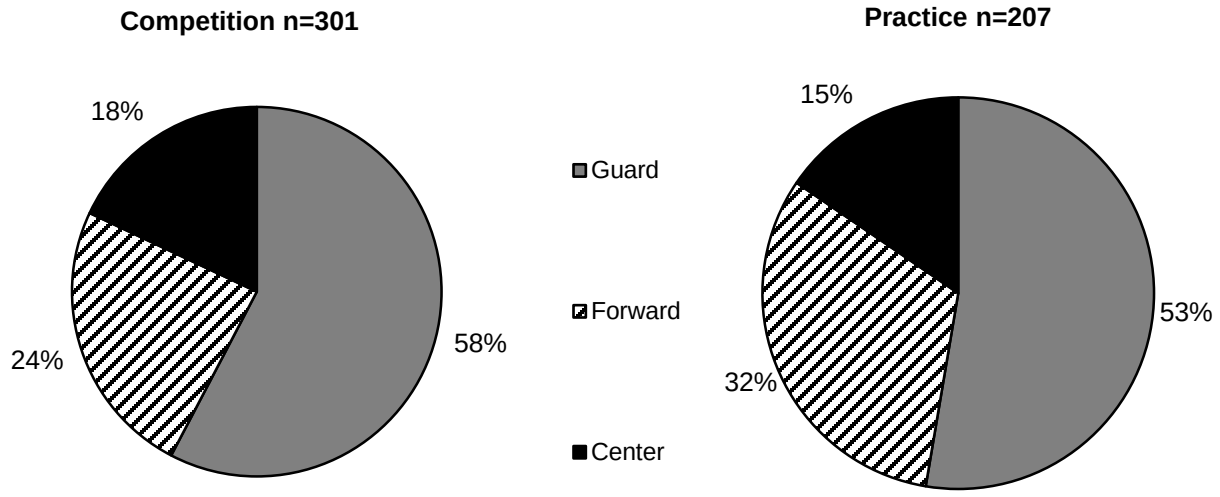


Table 8.9 Activities Leading to Girls' Basketball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	67	22.0%	80	38.3%	147	28.7%
Rebounding	60	19.7%	30	14.4%	90	17.5%
Defending	58	19.1%	17	8.1%	75	14.6%
Chasing loose ball	44	14.5%	17	8.1%	61	11.9%
Ball handling/dribbling	23	7.6%	13	6.2%	36	7.0%
Shooting	22	7.2%	13	6.2%	35	6.8%
Receiving pass	17	5.6%	10	4.8%	27	5.3%
Conditioning	0	0.0%	19	9.1%	19	3.7%
Passing	6	2.0%	1	0.5%	7	1.4%
Screening	1	0.3%	2	1.0%	3	0.6%
Other	6	2.0%	7	3.3%	13	2.5%
Total	**304**	**100%**	**209**	**100%**	**513**	**100%**

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

Table 8.10 Activity Resulting in Girls' Basketball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	71	28.5%	6	20.0%	4	13.3%	32	25.8%	34	42.5%
Rebounding	42	16.9%	6	20.0%	6	20.0%	28	22.6%	8	10.0%
Defending	34	13.7%	7	23.3%	4	13.3%	24	19.4%	6	7.5%
Chasing loose ball	28	11.2%	5	16.7%	4	13.3%	16	12.9%	8	10.0%
Shooting	23	9.2%	2	6.7%	2	6.7%	1	0.8%	7	8.8%
Other	51	20.5%	4	13.3%	10	33.4%	23	18.5%	17	21.2%
Total	**249**	**100%**	**30**	**100%**	**30**	**100%**	**124**	**100%**	**80**	**100%**

IX. Wrestling Injury Epidemiology

Table 9.1 Wrestling Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**589**	**241,675**	**2.44**
Competition	243	60,417	4.02
Practice	346	181,258	1.91

Table 9.2 Demographic Characteristics of Injured Wrestlers, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=559**
Freshman	27.2%
Sophomore	21.5%
Junior	23.3%
Senior	28.1%
Total†	**100%**
Age (years)	
Minimum	12
Maximum	19
Mean (St. Dev.)	15.9 (1.3)
BMI	
Minimum	16.6
Maximum	44.1
Mean (St. Dev.)	24.1 (4.6)

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

Figure 9.1 Diagnosis of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

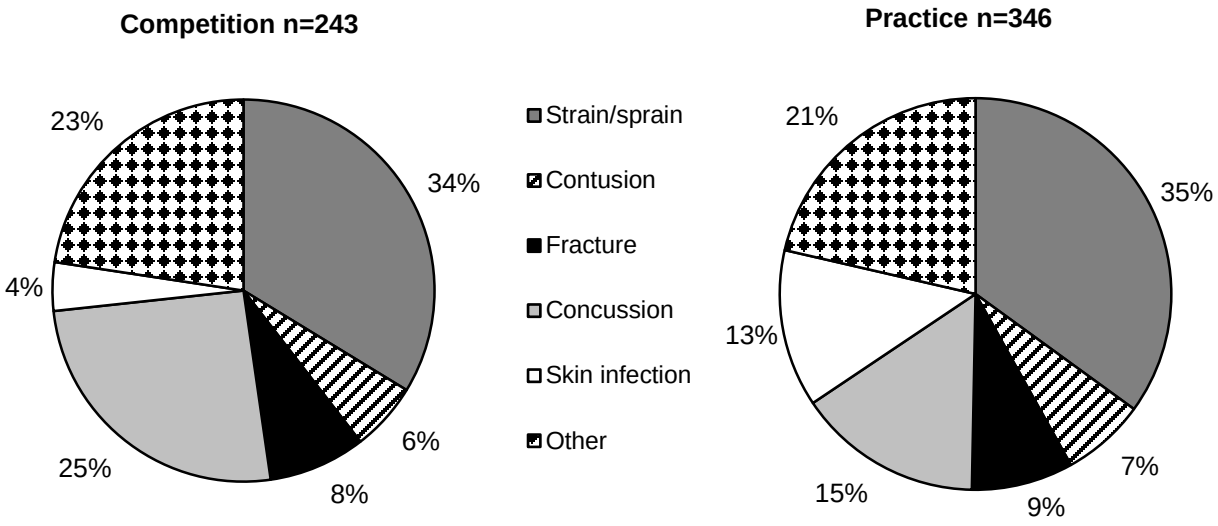


Table 9.3 Body Site of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	70	28.8%	86	24.9%	156	26.5%
Knee	42	17.3%	61	17.6%	103	17.5%
Shoulder	39	16.0%	41	11.8%	80	13.6%
Hand/wrist	18	7.4%	27	7.8%	45	7.6%
Trunk	13	5.3%	29	8.4%	42	7.1%
Ankle	15	6.2%	26	7.5%	41	7.0%
Arm/elbow	11	4.5%	28	8.1%	39	6.6%
Hip/thigh/upper leg	5	2.1%	14	4.0%	19	3.2%
Neck	9	3.7%	10	2.9%	19	3.2%
Foot	2	0.8%	8	2.3%	10	1.7%
Lower leg	3	1.2%	5	1.4%	8	1.4%
Other	16	6.6%	11	3.2%	27	4.6%
Total	**243**	**100%**	**346**	**100%**	**589**	**100%**

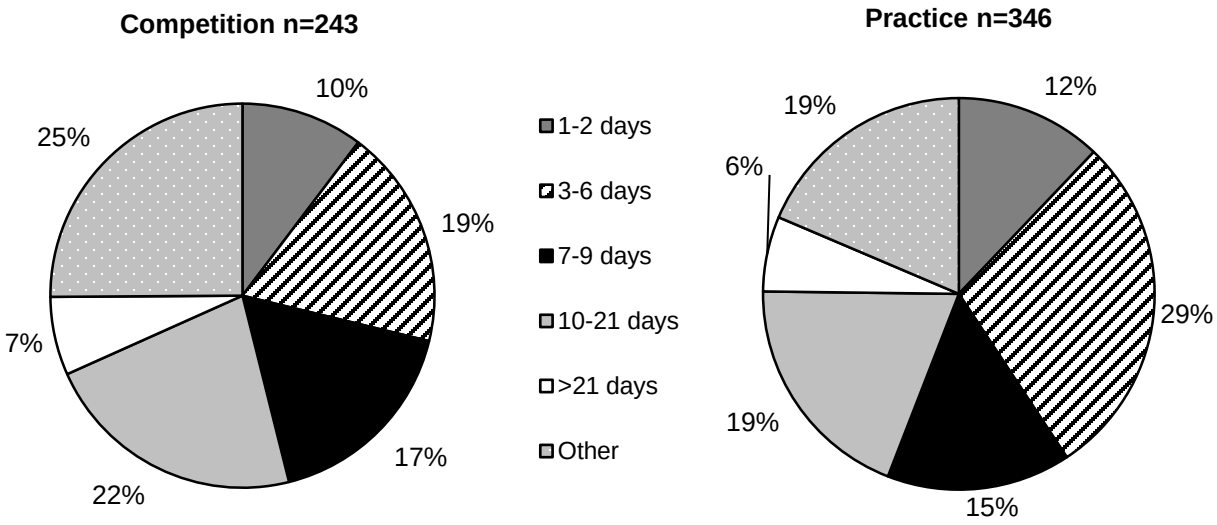
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.4 Ten Most Common Wrestling Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=243		Practice n=346		Total n=589	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	62	25.5%	53	15.3%	115	19.5%
Knee other	21	8.6%	24	6.9%	45	7.6%
Shoulder strain/sprain	21	8.6%	20	5.8%	41	7.0%
Knee strain/sprain	17	7.0%	23	6.6%	40	6.8%
Ankle strain/sprain	15	6.2%	25	7.2%	40	6.8%
Shoulder other	15	6.2%	15	4.3%	30	5.1%
Head/face skin infection	3	1.2%	20	5.8%	23	3.9%
Hand/wrist fracture	11	4.5%	9	2.6%	20	3.4%
Trunk strain/sprain	6	2.5%	14	4.0%	20	3.4%
Hip/thigh/upper leg strain/sprain	3	1.2%	12	3.5%	15	2.5%

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

Figure 9.2 Time Loss of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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 Wrestling Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	18	7.5%	19	5.5%	37	6.3%
Did not require surgery	223	92.5%	327	94.5%	550	93.7%
Total	**241**	**100%**	**346**	**100%**	**587**	**100%**

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

Figure 9.3 History of Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

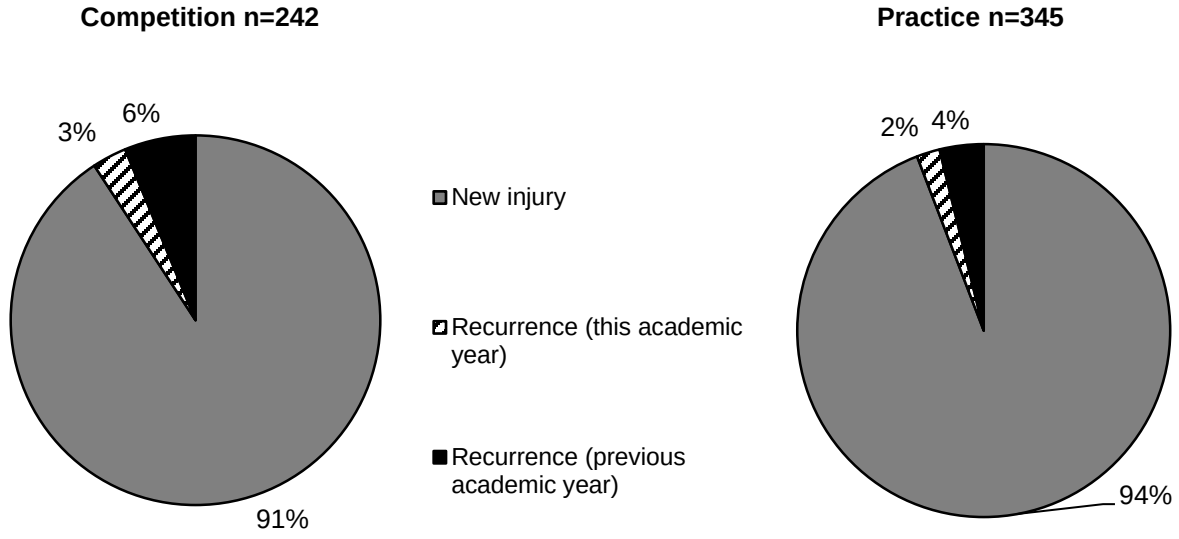


Table 9.6 Time during Season of Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	104	17.7%
Regular season	449	76.5%
Post season	34	5.8%
Total	**587**	**100%**

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

Table 9.7 Competition-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	4	2.0%
First period	36	18.2%
Second period	90	45.5%
Third period	68	34.3%
Overtime	0	0.0%
Total	**198**	**100%**
Mat Location*		
Within 28 ft. circle	453	89.9%
Out of bounds	25	5.0%
Off the mat	26	5.2%
Total	**504**	**100%**

*Mat location question consists of competition and practice related injuries.
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 9.8 Practice-Related Variables for Wrestling Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	39	11.9%
Second 1/2 hour	60	18.3%
1-2 hours into practice	191	58.2%
>2 hours into practice	38	11.6%
Total	**328**	**100%**

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

Table 9.9 Activities Leading to Wrestling Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Takedown	117	52.2%	101	33.1%	218	41.2%
Sparring	28	12.5%	57	18.7%	85	16.1%
N/A (e.g. skin infection, overuse, etc.)	10	4.5%	46	15.1%	56	10.6%
Escape	17	7.6%	18	5.9%	35	6.6%
Fall	13	5.8%	22	7.2%	35	6.6%
Conditioning	0	0.0%	26	8.5%	26	4.9%
Near fall	8	3.6%	6	2.0%	14	2.6%
Reversal	5	2.2%	9	3.0%	14	2.6%
Riding	8	3.6%	4	1.3%	12	2.3%
Other	18	8.0%	16	5.2%	34	6.4%
Total	**224**	**100%**	**305**	**100%**	**529**	**100%**

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

Table 9.10 Activities Resulting in Wrestling Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Takedown	81	42.9%	17	47.2%	21	48.8%	56	57.1%	43	26.4%
Near fall	5	2.6%	0	0.0%	2	4.7%	3	3.1%	4	2.5%
Riding	7	3.7%	1	2.8%	0	0.0%	0	0.0%	4	2.5%
Sparring	34	18.0%	6	16.7%	8	18.6%	17	17.3%	20	12.3%
Reversal	6	3.2%	1	2.8%	1	2.3%	4	4.1%	2	1.2%
Escape	19	10.1%	4	11.1%	0	0.0%	1	1.0%	11	6.7%
Other	37	19.6%	7	19.4%	11	25.6%	17	17.3%	79	48.5%
Total	**189**	**100%**	**36**	**100%**	**43**	**100%**	**98**	**100%**	**163**	**100%**

X. Baseball Injury Epidemiology

Table 10.1 Baseball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**221**	**258,797**	**0.85**
Competition	131	90,299	1.45
Practice	90	168,498	0.53

Table 10.2 Demographic Characteristics of Injured Baseball Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=217**
Freshman	20.3%
Sophomore	29.5%
Junior	25.8%
Senior	24.4%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.2 (1.2)
BMI	
Minimum	16.6
Maximum	34.2
Mean (St. Dev.)	23.7 (3.5)

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

Figure 10.1 Diagnosis of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

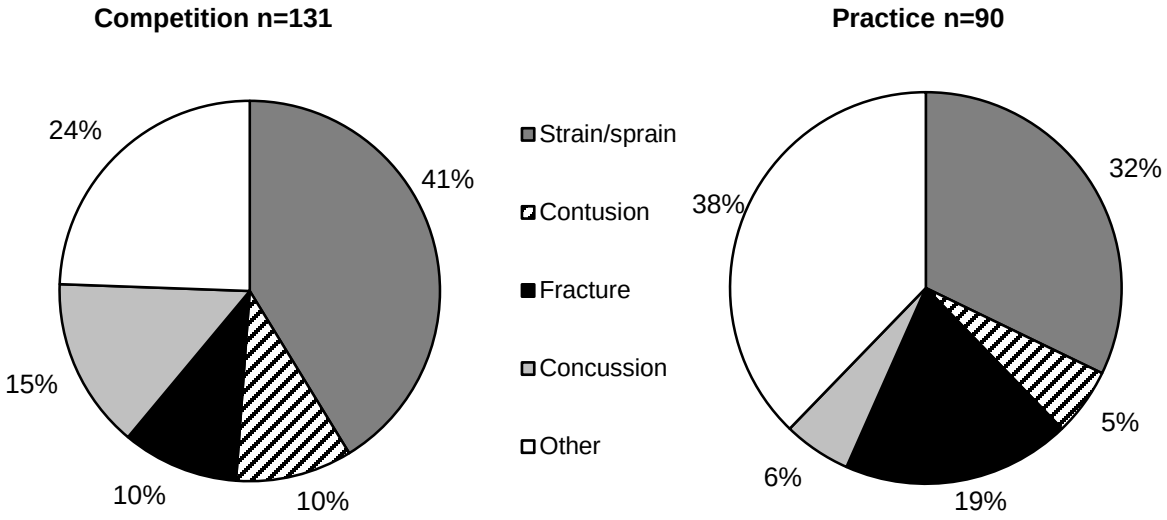


Table 10.3 Body Site of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

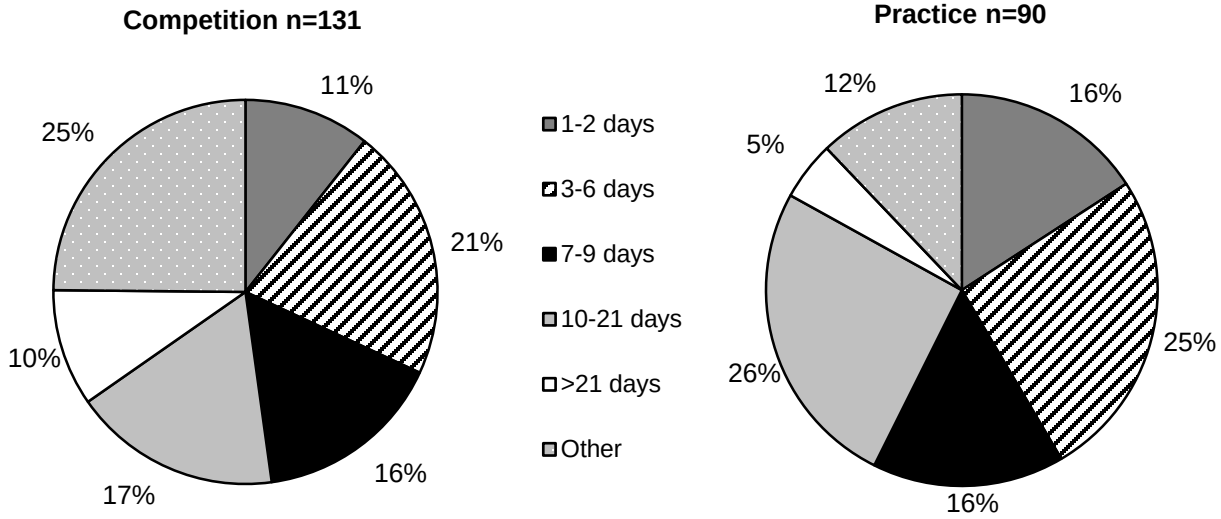
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	27	20.6%	12	13.3%	39	17.6%
Arm/elbow	21	16.0%	18	20.0%	39	17.6%
Shoulder	19	14.5%	16	17.8%	35	15.8%
Hand/wrist	18	13.7%	14	15.6%	32	14.5%
Ankle	14	10.7%	8	8.9%	22	10.0%
Hip/thigh/upper leg	14	10.7%	7	7.8%	21	9.5%
Knee	7	5.3%	3	3.3%	10	4.5%
Trunk	4	3.1%	6	6.7%	10	4.5%
Lower leg	4	3.1%	2	2.2%	6	2.7%
Foot	2	1.5%	2	2.2%	4	1.8%
Neck	0	0.0%	1	1.1%	1	0.5%
Other	1	0.8%	1	1.1%	2	0.9%
Total	**131**	**100%**	**90**	**100%**	**221**	**100%**

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

Table 10.4 Ten Most Common Baseball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=131		Practice n=90		Total n=221	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	19	14.5%	5	5.6%	24	10.9%
Shoulder other	10	7.6%	12	13.3%	22	10.0%
Hip/thigh/upper leg strain/sprain	11	8.4%	6	6.7%	17	7.7%
Arm/elbow strain/sprain	11	8.4%	6	6.7%	17	7.7%
Ankle strain/sprain	10	7.6%	5	5.6%	15	6.8%
Hand/wrist fracture	6	4.6%	8	8.9%	14	6.3%
Arm/elbow other	6	4.6%	7	7.8%	13	5.9%
Shoulder strain/sprain	8	6.1%	4	4.4%	12	5.4%
Hand/wrist strain/sprain	6	4.6%	3	3.3%	9	4.1%
Head/face other	4	3.1%	5	5.6%	9	4.1%

Figure 10.2 Time Loss of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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 Baseball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	8	6.2%	4	4.4%	12	5.5%
Did not require surgery	122	93.8%	86	95.6%	208	94.5%
Total	**130**	**100%**	**90**	**100%**	**220**	**100%**

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

Figure 10.3 History of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

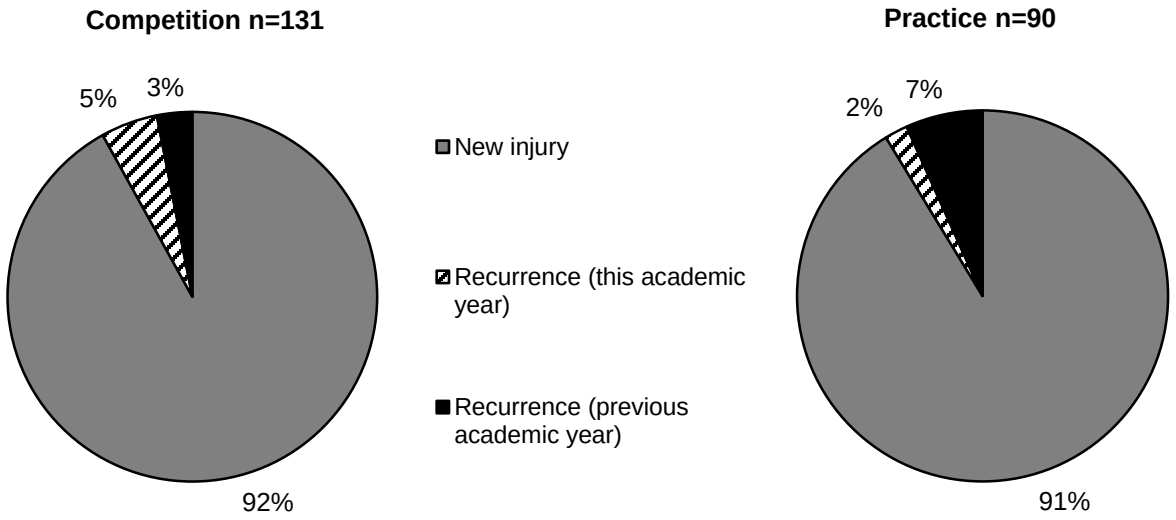


Table 10.6 Time during Season of Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	33	14.9%
Regular season	181	81.9%
Post season	7	3.2%
Total	**221**	**100%**

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

Table 10.7 Competition-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	10	8.6%
First inning	8	6.9%
Second inning	11	9.5%
Third inning	16	13.8%
Fourth inning	29	25.0%
Fifth inning	18	15.5%
Sixth inning	15	12.9%
Seventh inning	8	6.9%
Extra innings	1	.9%
Total	**116**	**100%**
Field Location		
Home plate	28	22.6%
First base	17	13.7%
Second base	13	10.5%
Third base	9	7.3%
Infield	7	5.6%
Pitcher's mound	24	19.4%
Outfield	13	10.5%
Foul territory	8	6.5%
Other	5	4.0%
Total	**124**	**100%**

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

Table 10.8 Practice-Related Variables for Baseball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	12	14.0%
Second 1/2 hour	21	24.4%
1-2 hours into practice	50	58.1%
>2 hours into practice	3	2.5%
Total	**86**	**100%**

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

Figure 10.4 Player Position of Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

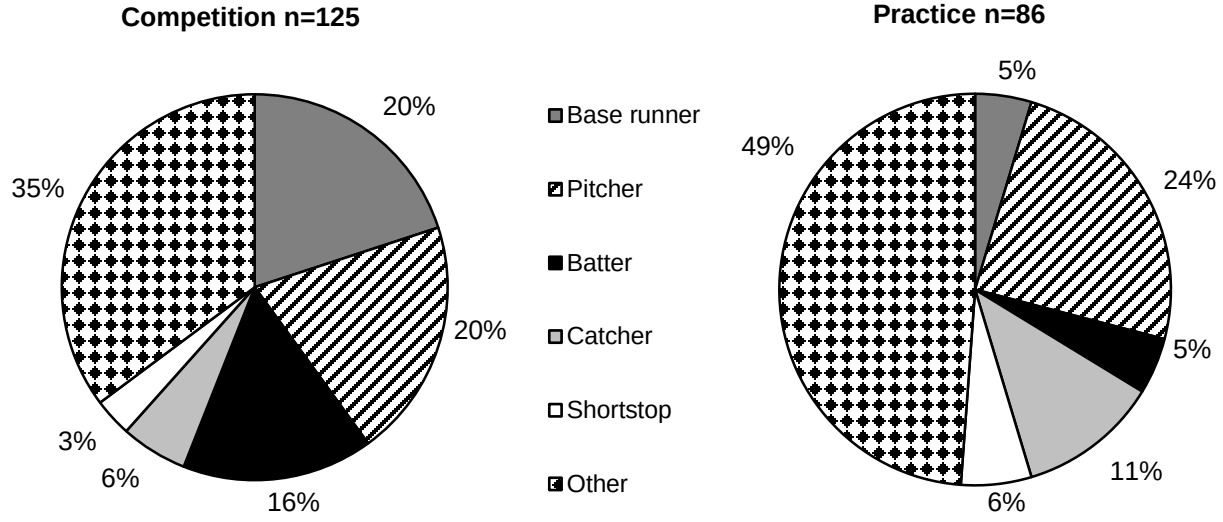


Table 10.9 Activities Leading to Baseball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Pitching	25	20.2%	16	18.4%	41	19.4%
Fielding a batted ball	19	15.3%	21	24.1%	40	19.0%
Running bases	24	19.4%	5	5.7%	29	13.7%
Batting	20	16.1%	8	9.2%	28	13.3%
Throwing (not pitching)	6	4.8%	14	16.1%	20	9.5%
Sliding	15	12.1%	3	3.4%	18	8.5%
General play	3	2.4%	10	11.5%	13	6.2%
Other	4	3.2%	4	4.6%	8	3.8%
Fielding a thrown ball	5	4.0%	1	1.1%	6	2.8%
Catching	3	2.4%	2	2.3%	5	2.4%
Conditioning	0	0.0%	3	3.4%	3	1.4%
Total	**124**	**100%**	**87**	**100%**	**211**	**100%**

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

Figure 10.10 Activity Resulting in Baseball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running bases	16	20.3%	1	5.6%	2	6.9%	3	13.6%	7	11.1%
Pitching	22	27.8%	2	11.1%	1	3.4%	1	4.5%	15	23.8%
Fielding a batted ball	14	17.7%	2	11.1%	10	34.5%	7	31.8%	7	11.1%
Batting	7	8.9%	6	33.3%	5	17.2%	3	13.6%	7	11.1%
Throwing (not pitching)	5	6.3%	0	0.0%	3	10.3%	0	0.0%	12	19.0%
Other	15	19.0%	7	38.9%	8	27.7%	8	36.5%	15	23.9%
Total	**79**	**100%**	**18**	**100%**	**29**	**100%**	**22**	**100%**	**63**	**100%**

XI. Softball Injury Epidemiology

Table 11.1 Softball Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**251**	**195,189**	**1.29**
Competition	150	68,230	2.20
Practice	101	126,959	0.80

Table 11.2 Demographic Characteristics of Injured Softball Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=249**
Freshman	21.3%
Sophomore	28.5%
Junior	26.5%
Senior	23.7%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	16.0 (1.2)
BMI	
Minimum	16.9
Maximum	36.3
Mean (St. Dev.)	23.9 (4.1)

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

Figure 11.1 Diagnosis of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

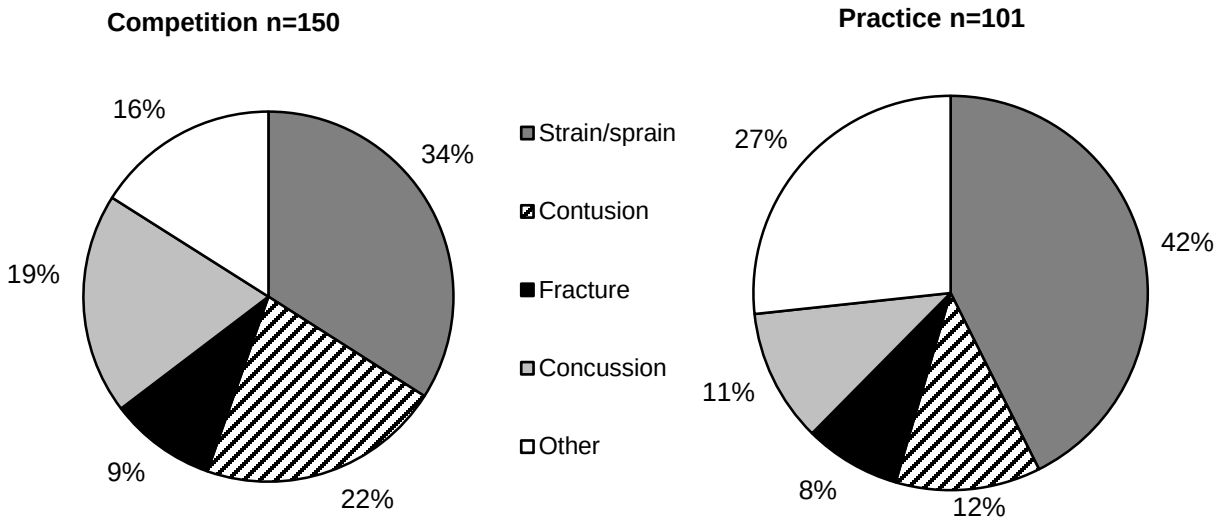


Table 11.3 Body Site of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

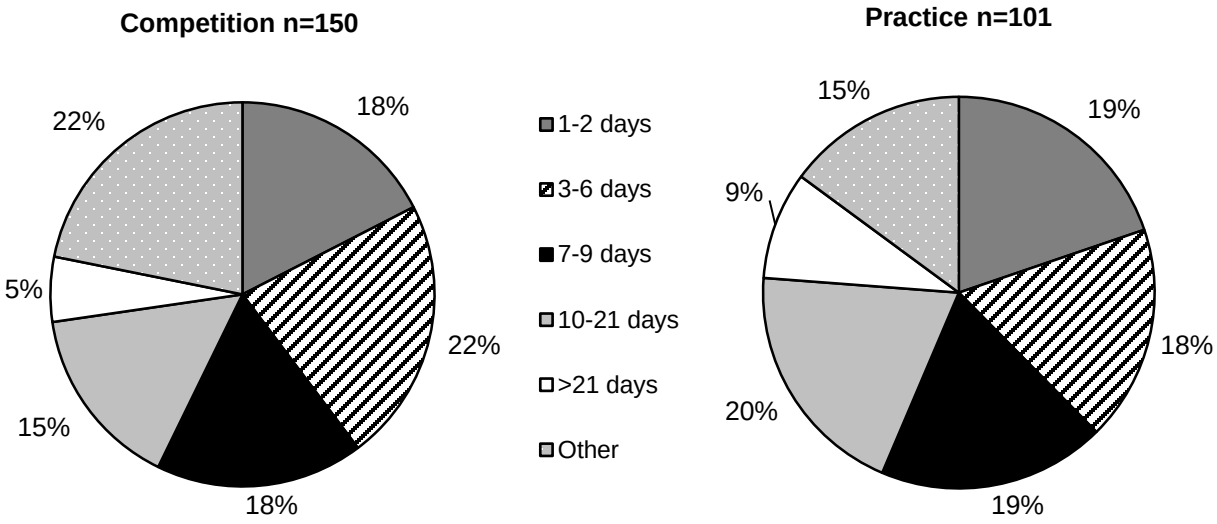
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	36	24.2%	19	18.8%	55	22.0%
Ankle	23	15.4%	16	15.8%	39	15.6%
Shoulder	14	9.4%	16	15.8%	30	12.0%
Hand/wrist	17	11.4%	9	8.9%	26	10.4%
Hip/thigh/upper leg	12	8.1%	12	11.9%	24	9.6%
Knee	13	8.7%	7	6.9%	20	8.0%
Arm/elbow	7	4.7%	9	8.9%	16	6.4%
Trunk	10	6.7%	5	5.0%	15	6.0%
Lower leg	9	6.0%	5	5.0%	14	5.6%
Foot	5	3.4%	0	0.0%	5	2.0%
Neck	0	0.0%	2	2.0%	2	0.8%
Other	3	2.0%	1	1.0%	4	1.6%
Total	**149**	**100%**	**101**	**100%**	**250**	**100%**

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

Table 11.4 Ten Most Common Softball Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=149		Practice n=101		Total n=250	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	28	18.8%	10	9.9%	38	15.2%
Ankle strain/sprain	21	14.1%	15	14.9%	36	14.4%
Hip/thigh/upper leg strain/sprain	10	6.7%	10	9.9%	20	8.0%
Shoulder other	7	4.7%	8	7.9%	15	6.0%
Shoulder strain/sprain	7	4.7%	8	7.9%	15	6.0%
Hand/wrist fracture	9	6.0%	4	4.0%	13	5.2%
Knee other	7	4.7%	3	3.0%	10	4.0%
Head/face contusion	5	3.4%	4	4.0%	9	3.6%
Hand/wrist contusion	7	4.7%	1	1.0%	8	3.2%
Arm/elbow strain/sprain	3	2.0%	4	4.0%	7	2.8%

Figure 11.2 Time Loss of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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 Softball Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	9	6.0%	2	2.0%	11	4.4%
Did not require surgery	140	94.0%	99	98.0%	239	95.6%
Total	**149**	**100%**	**101**	**100%**	**250**	**100%**

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

Figure 11.3 History of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

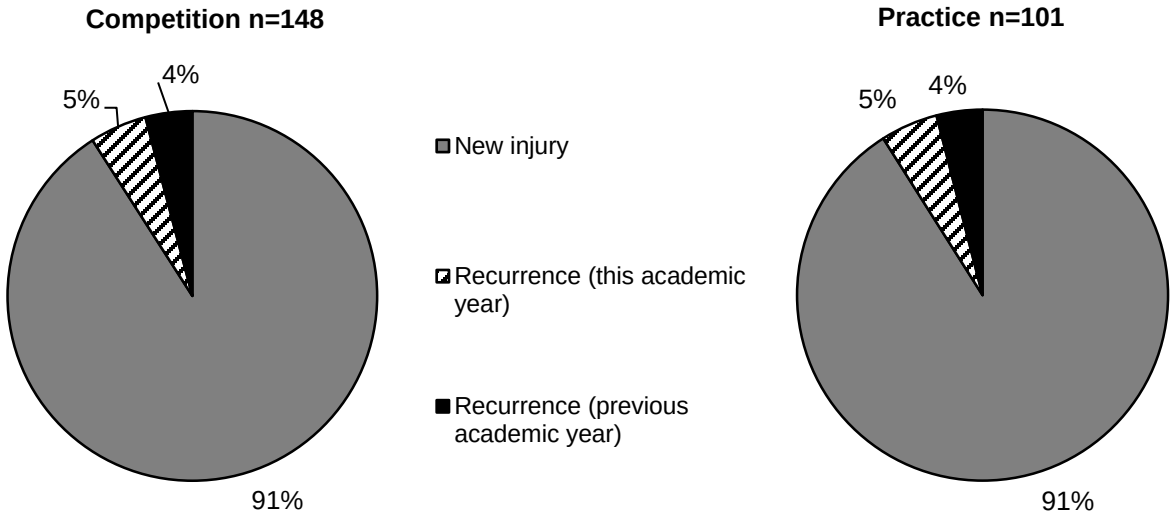


Table 11.6 Time during Season of Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	50	19.9%
Regular season	191	76.1%
Post season	10	4.0%
Total	**251**	**100%**

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

Table 11.7 Competition-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	12	8.9%
First inning	4	3.0%
Second inning	10	7.4%
Third inning	24	17.8%
Fourth inning	31	23.0%
Fifth inning	27	20.0%
Sixth inning	15	11.1%
Seventh inning	12	8.9%
Total	**135**	**100%**
Field Location		
Home plate	32	22.7%
First base	20	14.2%
Second base	23	16.3%
Third base	14	9.9%
Outfield	23	16.3%
Pitcher's mound	13	9.2%
Infield	6	4.3%
Foul territory	5	3.5%
Other	5	3.5%
Total	**141**	**100%**

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

Table 11.8 Practice-Related Variables for Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	15	15.8%
Second 1/2 hour	21	22.1%
1-2 hours into practice	57	60.0%
>2 hours into practice	2	2.1%
Total	**95**	**100%**

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

Figure 11.4 Player Position of Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

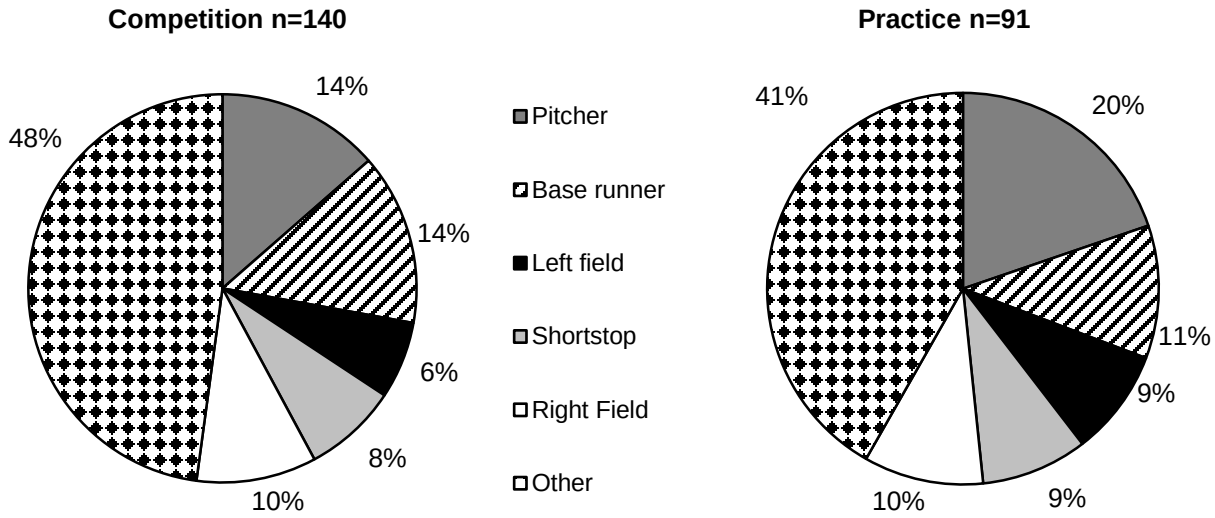


Table 11.9 Activities Leading to Softball Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running bases	38	26.6%	8	8.7%	46	19.6%
Fielding a batted ball	25	17.5%	18	19.6%	43	18.3%
Pitching	14	9.8%	13	14.1%	27	11.5%
Throwing (not pitching)	7	4.9%	20	21.7%	27	11.5%
Sliding	15	10.5%	5	5.4%	20	8.5%
Catching	16	11.2%	4	4.3%	20	8.5%
Batting	15	10.5%	3	3.3%	18	7.7%
Fielding a thrown ball	4	2.8%	8	8.7%	12	5.1%
General play	5	3.5%	6	6.5%	11	4.7%
Conditioning	0	0.0%	5	5.4%	5	2.1%
Other	4	2.8%	2	2.2%	6	2.6%
Total	**143**	**100%**	**92**	**100%**	**235**	**100%**

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

Table 11.10 Activity Resulting in Softball Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Fielding a batted ball	12	13.6%	11	25.0%	6	27.3%	8	21.6%	6	13.6%
Running bases	32	36.4%	4	9.1%	1	4.5%	6	16.2%	3	6.8%
Throwing (not pitching)	10	11.4%	1	2.3%	2	9.1%	3	8.1%	11	25.0%
Sliding	9	10.2%	1	2.3%	4	18.2%	1	2.7%	5	11.4%
General play	4	4.5%	2	4.5%	1	4.5%	3	8.1%	1	2.3%
Other	21	23.9%	25	56.8%	8	36.4%	16	43.3%	18	40.9%
Total	**88**	**100%**	**44**	**100%**	**22**	**100%**	**37**	**100%**	**44**	**100%**

XII. Girls' Field Hockey Injury Epidemiology

Table 12.1 Girls' Field Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**102**	**70,542**	**1.45**
Competition	48	21,748	2.21
Practice	54	48,794	1.11

Table 12.2 Demographic Characteristics of Injured Girls' Field Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=102**
Freshman	25.5%
Sophomore	32.4%
Junior	14.7%
Senior	27.5%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.5 (1.2)
BMI	
Minimum	16.6
Maximum	32.6
Mean (St. Dev.)	22.0 (3.1)

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

Figure 12.1 Diagnosis of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

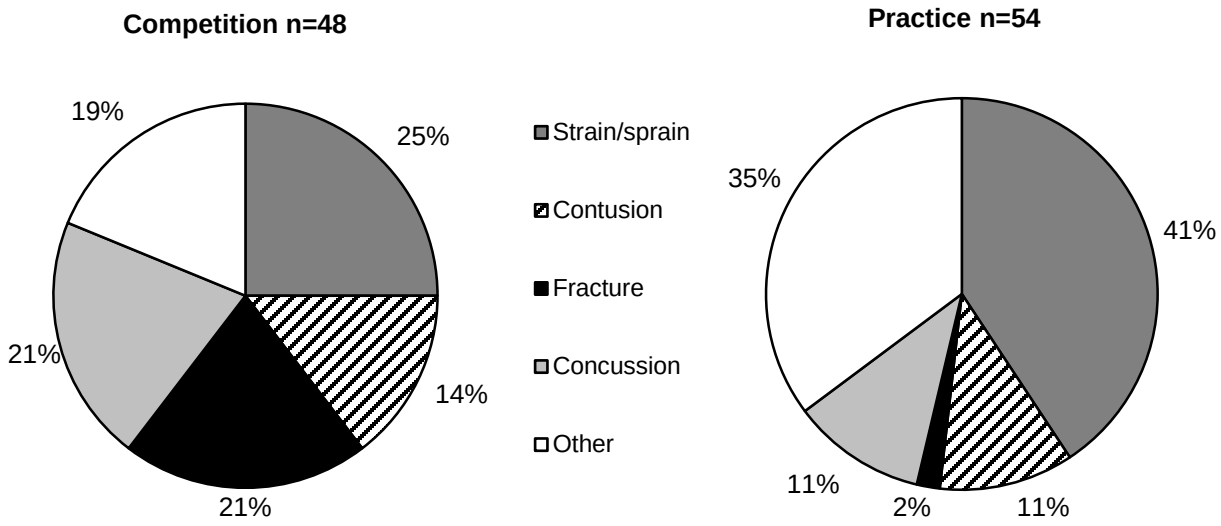


Table 12.3 Body Site of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

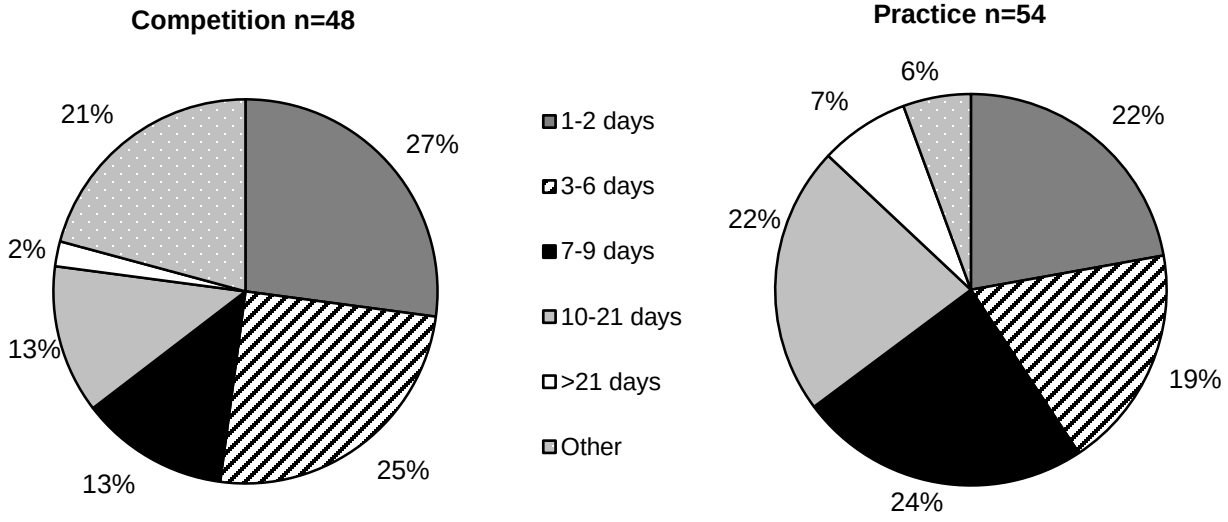
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	15	31.3%	9	16.7%	24	23.5%
Ankle	5	10.4%	10	18.5%	15	14.7%
Hand/wrist	10	20.8%	3	5.6%	13	12.7%
Hip/thigh/upper leg	3	6.3%	9	16.7%	12	11.8%
Knee	10	20.8%	2	3.7%	12	11.8%
Lower leg	1	2.1%	8	14.8%	9	8.8%
Trunk	0	0.0%	5	9.3%	5	4.9%
Foot	0	0.0%	4	7.4%	4	3.9%
Arm/elbow	2	4.2%	0	0.0%	2	2.0%
Shoulder	0	0.0%	1	1.9%	1	1.0%
Neck	1	2.1%	0	0.0%	1	1.0%
Other	1	2.1%	3	5.6%	4	3.9%
Total	**48**	**100%**	**54**	**100%**	**102**	**100%**

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

Table 12.4 Ten Most Common Girls' Field Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=48		Practice n=54		Total n=102	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	10	20.8%	6	11.1%	16	15.7%
Ankle strain/sprain	5	10.4%	10	18.5%	15	14.7%
Hip/thigh/upper leg strain/sprain	3	6.3%	6	11.1%	9	8.8%
Lower leg other	0	0.0%	8	14.8%	8	7.8%
Knee other	5	10.4%	2	3.7%	7	6.9%
Hand/wrist fracture	6	12.5%	1	1.9%	7	6.9%
Head/face other	3	6.3%	2	3.7%	5	4.9%
Hand/wrist contusion	4	8.3%	1	1.9%	5	4.9%
Knee sprain/strain	4	8.3%	0	0.0%	4	3.9%
Other	1	2.1%	3	5.6%	4	3.9%

Figure 12.2 Time Loss of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 12.5 Girls' Field Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	4	8.3%	2	3.7%	6	5.9%
Did not require surgery	44	91.7%	52	96.3%	96	94.1%
Total	**48**	**100%**	**54**	**100%**	**102**	**100%**

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

Figure 12.3 History of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

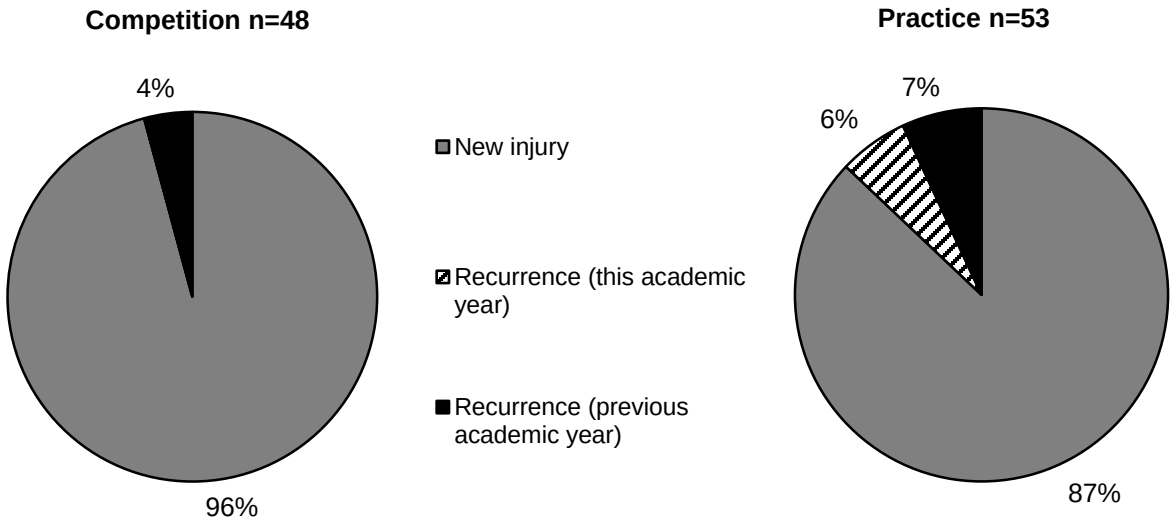


Table 12.6 Time during Season of Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	29	28.7%
Regular season	67	66.3%
Post season	5	5.0%
Total	**101**	**100%**

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

Table 12.7 Competition-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	4	8.3%
First half	12	25.0%
Second half	32	66.7%
Overtime	-	0.0%
Total	**48**	**100%**
Field Location		
Between 25-yard line and center line	19	39.6
Within 25-yard line	13	27.1
Within 16-yard arc	8	16.7
Goal area/circle	6	12.5
Sideline	1	2.1
Other	1	2.1
Total	**48**	**100%**

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

Table 12.8 Practice-Related Variables for Girls' Field Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	10	19.2%
Second 1/2 hour	7	13.5%
1-2 hours into practice	32	61.5%
>2 hours into practice	3	5.8%
Total	**52**	**100%**

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

Figure 12.4 Player Position of Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

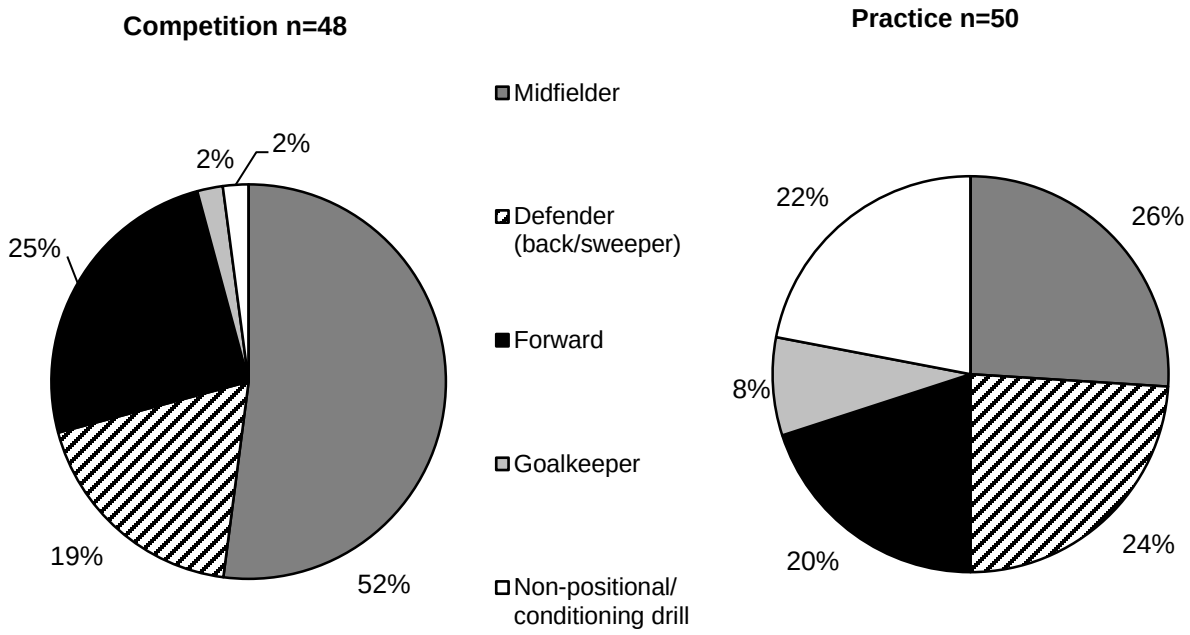


Table 12.9 Activities Leading to Girls' Field Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Defending	18	37.5%	9	18.0%	27	27.6%
General play	10	20.8%	10	20.0%	20	20.4%
Conditioning	0	0.0%	15	30.0%	15	15.3%
Ball handling/dribbling	6	12.5%	7	14.0%	13	13.3%
Chasing a loose ball	7	14.6%	2	4.0%	9	9.2%
Goaltending	1	2.1%	3	6.0%	4	4.1%
Shooting	2	4.2%	1	2.0%	3	3.1%
Penalty corner	1	2.1%	2	4.0%	3	3.1%
Passing	2	4.2%	0	0.0%	2	2.0%
Receiving pass	1	2.1%	1	2.0%	2	2.0%
Other	0	0.0%	0	0.0%	0	0.0%
Total	**48**	**100%**	**50**	**100%**	**98**	**100%**

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

Table 12.10 Activity Resulting in Girls' Field Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	11	34.4%	2	15.4%	2	18.2%	3	18.8%	2	7.7%
Conditioning	3	9.4%	0	0.0%	0	0.0%	0	0.0%	12	46.2%
Defending	3	9.4%	8	61.5%	3	27.3%	6	37.5%	7	26.9%
Chasing a loose ball	5	15.6%	1	7.7%	1	9.1%	0	0.0%	2	7.7%
Ball handling/dribbling	6	18.8%	0	0.0%	3	27.3%	2	12.5%	2	7.7%
Other	4	12.4%	2	15.4%	2	18.1%	5	31.2%	1	3.8%
Total	**32**	**100%**	**13**	**100%**	**11**	**100%**	**16**	**100%**	**26**	**100%**

XIII. Boys' Ice Hockey Injury Epidemiology

Table 13.1 Boys' Ice Hockey Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**111**	**58,247**	**1.91**
Competition	99	21,849	4.53
Practice	12	36,398	0.33

Table 13.2 Demographic Characteristics of Injured Boys' Ice Hockey Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=106**
Freshman	21.7%
Sophomore	21.7%
Junior	20.8%
Senior	35.8%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.1 (1.4)
BMI	
Minimum	16.8
Maximum	29.8
Mean (St. Dev.)	23.3 (2.6)

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

Figure 13.1 Diagnosis of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

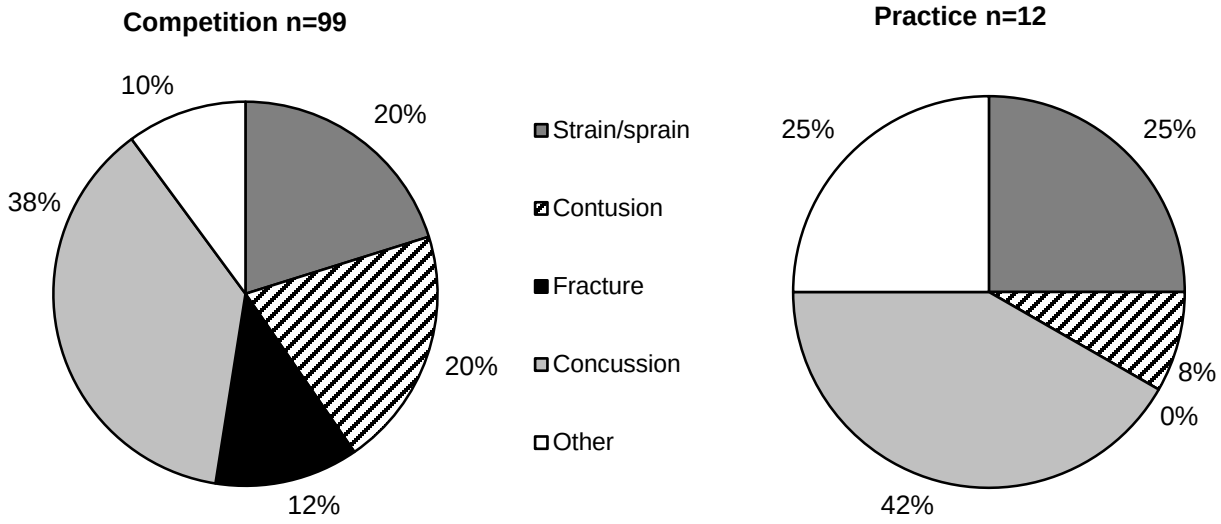


Table 13.3 Body Site of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Head/face	38	38.4%	5	41.7%	43	38.7%
Shoulder	15	15.2%	1	8.3%	16	14.4%
Trunk	14	14.1%	0	0.0%	14	12.6%
Knee	5	5.1%	2	16.7%	7	6.3%
Hand/wrist	7	7.1%	0	0.0%	7	6.3%
Hip/thigh/upper leg	5	5.1%	1	8.3%	6	5.4%
Ankle	6	6.1%	0	0.0%	6	5.4%
Arm/elbow	3	3.0%	1	8.3%	4	3.6%
Foot	0	0.0%	2	16.7%	2	1.8%
Neck	2	2.0%	0	0.0%	2	1.8%
Other	4	4.0%	0	0.0%	4	3.6%
Total	**99**	**100%**	**12**	**100%**	**111**	**100%**

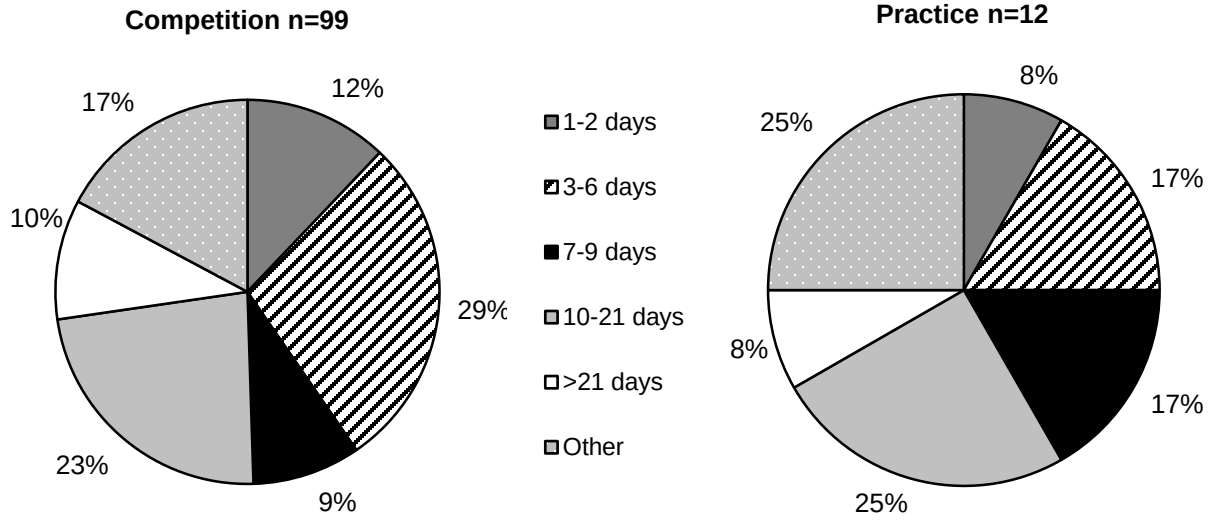
†Totals and n's are not always equal due to slight rounding or missing responses.

Table 13.4 Ten Most Common Boys' Ice Hockey Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=99		Practice n=12		Total n=111	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	36	36.4%	5	41.7%	41	36.9%
Trunk contusion	10	10.1%	0	0.0%	10	9.0%
Shoulder other	8	8.1%	0	0.0%	8	7.2%
Shoulder strain/sprain	6	6.1%	1	8.3%	7	6.3%
Ankle strain/sprain	6	6.1%	0	0.0%	6	5.4%
Hip/thigh/upper leg contusion	0	0.0%	5	41.7%	5	4.5%
Hand/wrist fracture	5	5.1%	0	0.0%	5	4.5%
Knee strain/sprain	3	3.0%	1	8.3%	4	3.6%
Arm/elbow fracture	2	2.0%	0	0.0%	2	1.8%
Head/face fracture	2	2.0%	0	0.0%	2	1.8%

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

Figure 13.2 Time Loss of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 13.5 Boys' Ice Hockey Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	2	2.1%	0	0.0%	2	1.9%
Did not require surgery	92	97.9%	12	100.0%	104	98.1%
Total	**94**	**100%**	**12**	**100%**	**106**	**100%**

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

Figure 13.3 History of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

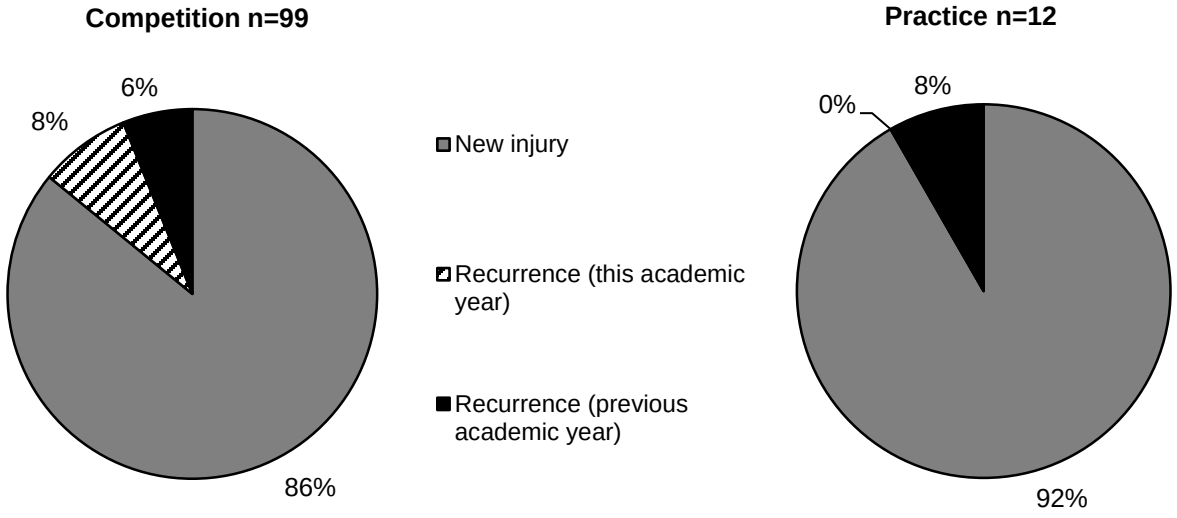


Table 13.6 Time during Season of Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	4	3.7%
Regular season	101	93.5%
Post season	3	2.8%
Total	**108**	**100%**

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

Table 13.7 Competition-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Warm-ups	1	1.1%
First period	20	23.0%
Second period	44	50.6%
Third period	22	25.3%
Overtime	-	0.0%
Total	**87**	**100%**
Rink Location		
Between goal line and blue line	36	40.9%
Neutral zone	16	18.2%
Behind goal	12	13.6%
Corner	11	12.5%
Goal area	9	10.2%
Face-off circle	3	3.4%
Bench	1	1.1%
Other	0	0.0%
Total	**88**	**100%**

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

Table 13.8 Practice-Related Variables for Boys' Ice Hockey Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	-	0.0%
Second 1/2 hour	2	20.0%
1-2 hours into practice	6	60.0%
>2 hours into practice	2	20.0%
Total	**10**	**100%**

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

Figure 13.4 Player Position of Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

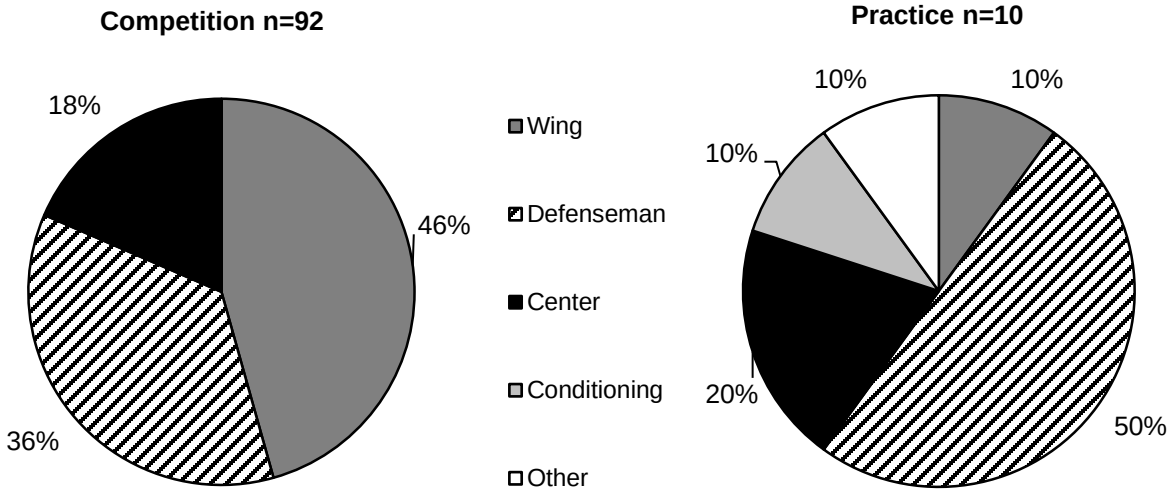


Table 13.9 Activities Leading to Boys' Ice Hockey Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Skating	32	35.2%	5	50.0%	37	36.6%
Being checked	25	27.5%	3	30.0%	28	27.7%
Checking	12	13.2%	0	0.0%	12	11.9%
Chasing loose puck	7	7.7%	1	10.0%	8	7.9%
Passing	6	6.6%	0	0.0%	6	5.9%
Shooting	3	3.3%	0	0.0%	3	3.0%
Receiving pass	3	3.3%	0	0.0%	3	3.0%
Goaltending	1	1.1%	1	10.0%	2	2.0%
Other	2	2.2%	0	0.0%	2	2.0%
Total	**91**	**100%**	**10**	**100%**	**101**	**100%**

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

Table 13.10 Activity Resulting in Boys' Ice Hockey Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Skating	8	36.4%	7	41.2%	2	20.0%	15	37.5%	5	41.7%
Shooting	1	4.5%	0	0.0%	0	0.0%	2	5.0%	0	0.0%
Passing	1	4.5%	1	5.9%	0	0.0%	4	10.0%	0	0.0%
Checking	3	13.6%	3	17.6%	1	10.0%	3	7.5%	2	16.7%
Being checked	4	18.2%	5	29.4%	4	40.0%	12	30.0%	3	25.0%
Other	5	22.8%	1	5.9%	3	30.0%	4	10.0%	2	16.6%
Total	**22**	**100%**	**17**	**100%**	**10**	**100%**	**40**	**100%**	**12**	**100%**

XIV. Boys' Lacrosse Injury Epidemiology

Table 14.1 Boys' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**249**	**133,189**	**1.87**
Competition	167	39,277	4.25
Practice	82	93,912	0.87

Table 14.2 Demographic Characteristics of Injured Boys' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=244**
Freshman	17.2%
Sophomore	23.4%
Junior	27.0%
Senior	32.4%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.3 (1.3)
BMI	
Minimum	17.2
Maximum	32.3
Mean (St. Dev.)	23.7 (2.8)

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

Figure 14.1 Diagnosis of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

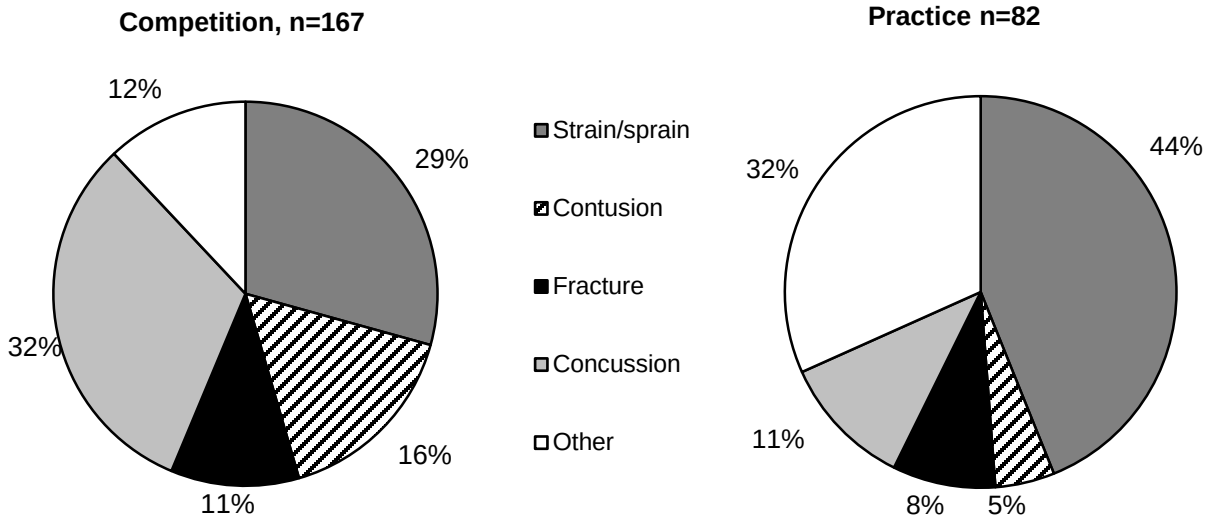


Table 14.3 Body Site of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

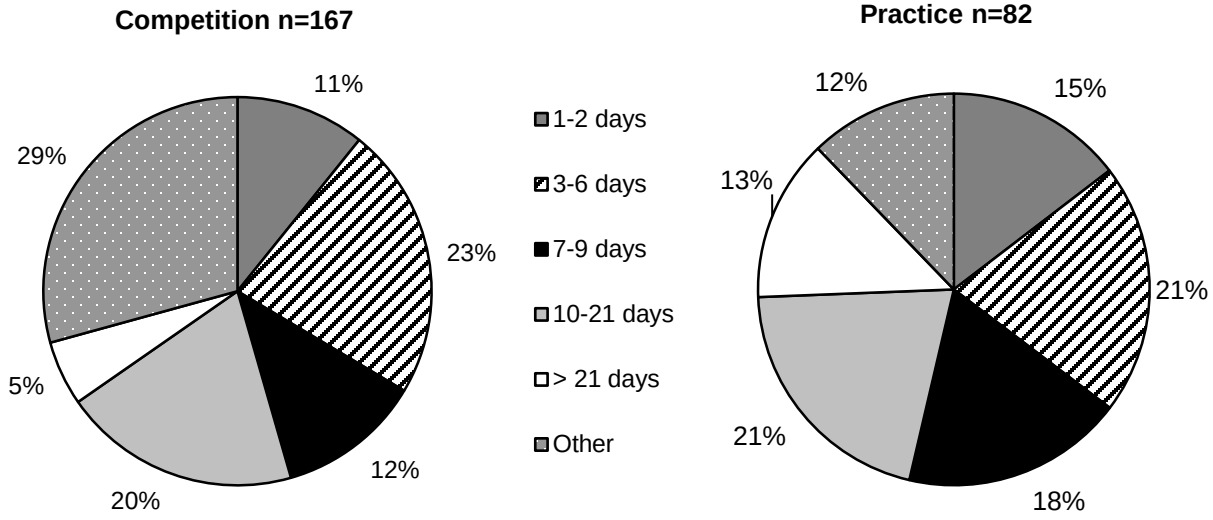
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	60	35.9%	10	12.2%	70	28.1%
Hip/thigh/upper leg	13	7.8%	17	20.7%	30	12.0%
Knee	20	12.0%	9	11.0%	29	11.6%
Ankle	14	8.4%	9	11.0%	23	9.2%
Hand/wrist	15	9.0%	6	7.3%	21	8.4%
Shoulder	11	6.6%	10	12.2%	21	8.4%
Trunk	12	7.2%	7	8.5%	19	7.6%
Lower leg	8	4.8%	6	7.3%	14	5.6%
Arm/elbow	4	2.4%	4	4.9%	8	3.2%
Foot	3	1.8%	2	2.4%	5	2.0%
Neck	3	1.8%	1	1.2%	4	1.6%
Other	4	2.4%	1	1.2%	5	2.0%
Total	**167**	**100%**	**82**	**100%**	**249**	**100%**

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

Table 14.4 Ten Most Common Boys' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=167		Practice n=82		Total n=249	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	53	31.7%	9	11.0%	62	24.9%
Ankle strain/sprain	14	8.4%	8	9.8%	22	8.8%
Hip/thigh/upper leg strain/sprain	5	3.0%	16	19.5%	21	8.4%
Hand/wrist fracture	9	5.4%	4	4.9%	13	5.2%
Knee other	7	4.2%	5	6.1%	12	4.8%
Knee strain/sprain	8	4.8%	3	3.7%	11	4.4%
Trunk strain/sprain	6	3.6%	4	4.9%	10	4.0%
Shoulder strain/sprain	7	4.2%	3	3.7%	10	4.0%
Shoulder other	3	1.8%	7	8.5%	10	4.0%
Hip/thigh/upper leg contusion	6	3.6%	0	0.0%	6	2.4%

Figure 14.2 Time Loss of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 14.5 Boys' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	8	4.8%	5	6.3%	13	5.3%
Did not require surgery	159	95.2%	74	93.7%	233	94.7%
Total	**167**	**100%**	**79**	**100%**	**246**	**100%**

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

Figure 14.3 History of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

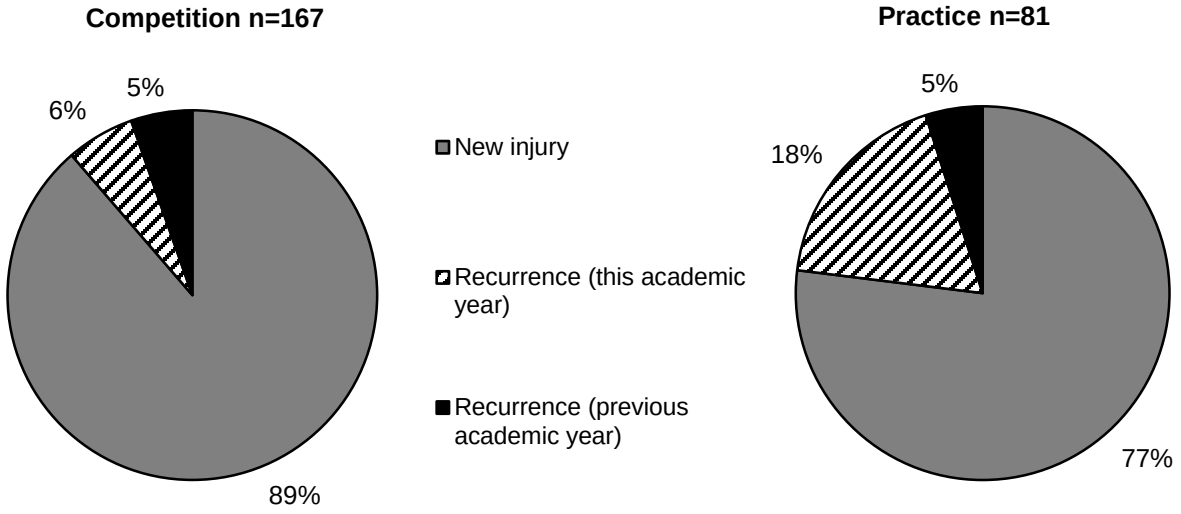


Table 14.6 Time during Season of Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	41	16.5%
Regular season	200	80.3%
Post season	8	3.2%
Total	**249**	**100%**

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

Table 14.7 Competition-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-competition/warm-ups	3	1.9%
First quarter	13	8.3%
Second quarter	39	25.0%
Third quarter	56	35.9%
Fourth quarter	45	28.8%
Overtime	-	-
Total	**156**	**100%**
Field Location		
Midfield	51	33.3%
Goal area	43	28.1%
Defensive area	31	20.3%
Wing area	15	9.8%
Crease area	9	5.9%
Sideline	4	2.6%
Total	**153**	**100%**

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

Table 14.8 Practice-Related Variables for Boys' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First ½ hour	9	11.5%
Second ½ hour	17	21.8%
1-2 hours into practice	45	57.7%
> 2 hours into practice	7	9.0%
Total	**78**	**100%**

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

Figure 14.4 Player Position of Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

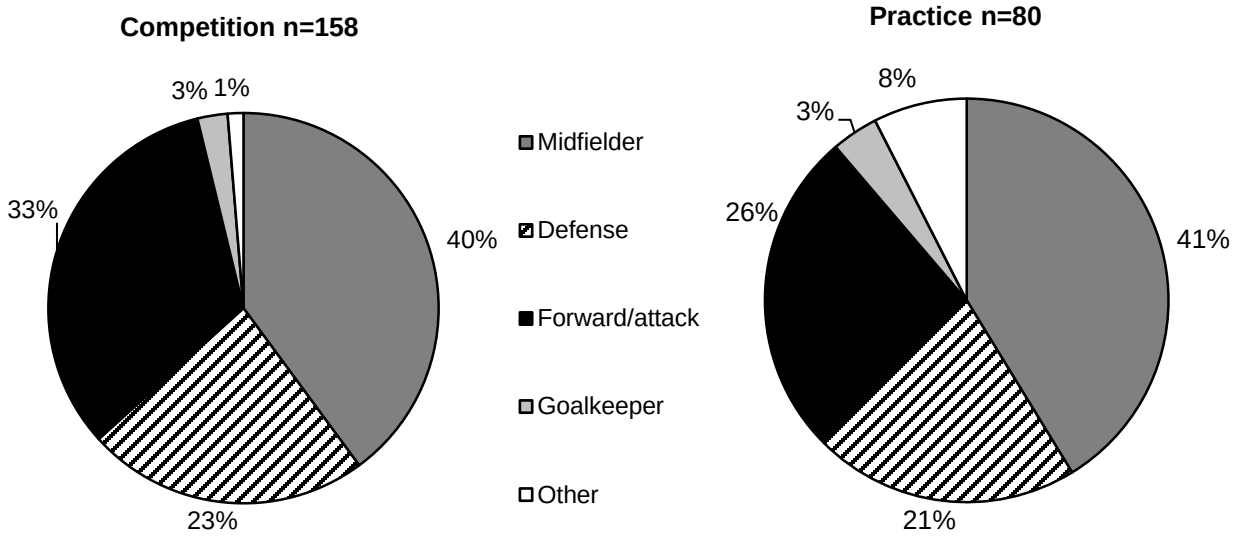


Table 14.9 Activities Leading to Boys' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	22	13.9%	23	29.1%	45	19.0%
Defending	22	13.9%	10	12.7%	32	13.5%
Shooting	19	12.0%	7	8.9%	26	11.0%
Ball handling/cradling	12	7.6%	7	8.9%	19	8.0%
Chasing loose ball	12	7.6%	7	8.9%	19	8.0%
Body checking	16	10.1%	2	2.5%	18	7.6%
Being body checked	16	10.1%	1	1.3%	17	7.2%
Being crosse/stick checked	8	5.1%	4	5.1%	12	5.1%
Passing	8	5.1%	1	1.3%	9	3.8%
Receiving pass	7	4.4%	2	2.5%	9	3.8%
Conditioning	1	0.6%	7	8.9%	8	3.4%
Goaltending	4	2.5%	3	3.8%	7	3.0%
Face-off	4	2.5%	1	1.3%	5	2.1%
Other	3	1.9%	2	2.5%	5	2.1%
Crosse/stick checking	3	1.9%	0	0.0%	3	1.3%
Blocking shot	1	0.6%	2	2.5%	3	1.3%
Total	**158**	**100%**	**79**	**100%**	**237**	**100%**

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

Table 14.10 Activity Resulting in Boys' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General Play	24	29.3%	1	3.2%	3	12.0%	7	12.5%	10	23.3%
Being Body Checked	3	3.7%	5	16.1%	0	0.0%	9	16.1%	0	0.0%
Shooting	10	12.2%	3	9.7%	1	4.0%	5	8.9%	7	16.3%
Being Crosse/Stick Checked	2	2.4%	4	12.9%	3	12.0%	1	1.8%	2	4.7%
Chasing Loose Ball	10	12.2%	2	6.5%	4	16.0%	2	3.6%	1	2.3%
Other	33	40.2%	16	51.6%	14	56.0%	32	57.1%	23	53.5%
Total	**82**	**100%**	**31**	**100%**	**25**	**100%**	**56**	**100%**	**43**	**100%**

XV. Girls' Lacrosse Injury Epidemiology

Table 15.1 Girls' Lacrosse Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**174**	**99,988**	**1.74**
Competition	100	30,749	3.25
Practice	74	69,239	1.07

Table 15.2 Demographic Characteristics of Injured Girls' Lacrosse Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=167**
Freshman	29.3%
Sophomore	25.7%
Junior	22.8%
Senior	22.2%
Total	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.8 (1.2)
BMI	
Minimum	17.0
Maximum	39.0
Mean (St. Dev.)	22.8 (3.5)

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

Figure 15.1 Diagnosis of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

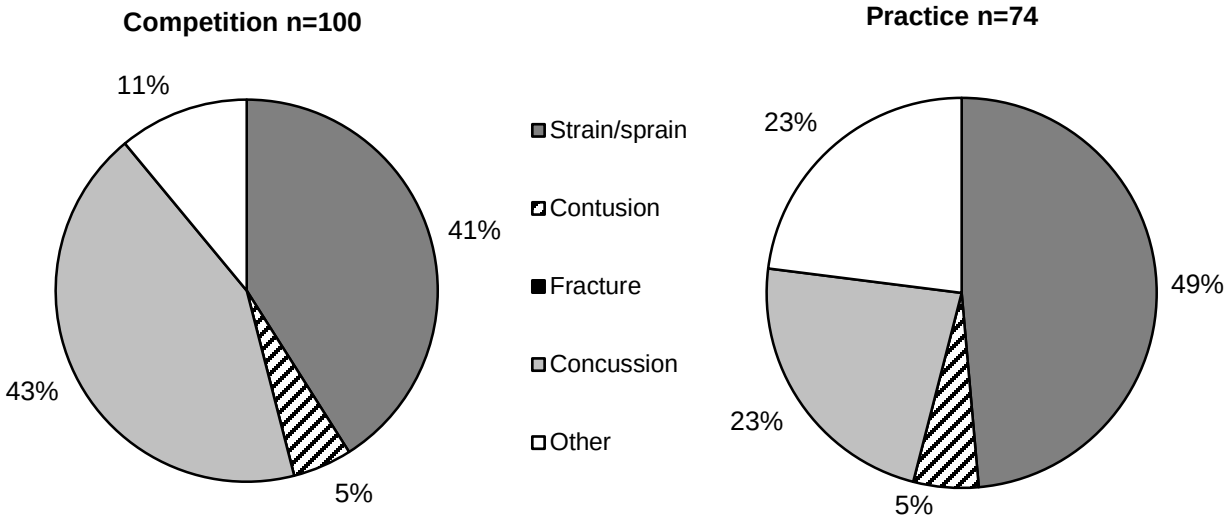


Table 15.3 Body Site of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

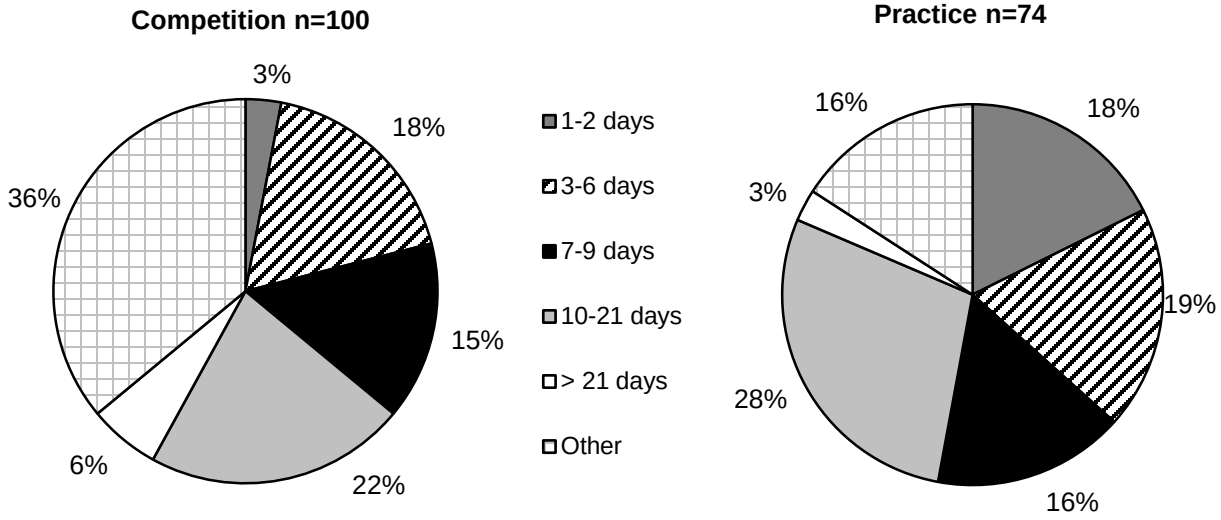
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	45	45.0%	20	27.0%	65	37.4%
Ankle	17	17.0%	18	24.3%	35	20.1%
Knee	23	23.0%	9	12.2%	32	18.4%
Lower leg	2	2.0%	11	14.9%	13	7.5%
Hip/thigh/upper leg	3	3.0%	9	12.2%	12	6.9%
Foot	2	2.0%	3	4.1%	5	2.9%
Hand/wrist	4	4.0%	0	0.0%	4	2.3%
Arm/elbow	2	2.0%	0	0.0%	2	1.1%
Shoulder	1	1.0%	1	1.4%	2	1.1%
Neck	1	1.0%	1	1.4%	2	1.1%
Trunk	0	0.0%	1	1.4%	1	0.6%
Other	0	0.0%	1	1.4%	1	0.6%
Total	**100**	**100%**	**74**	**100%**	**174**	**100%**

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

Table 15.4 Ten Most Common Girls' Lacrosse Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=100		Practice n=74		Total n=174	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	43	43.0%	17	23.0%	60	34.5%
Ankle strain/sprain	16	16.0%	17	23.0%	33	19.0%
Knee strain/sprain	16	16.0%	4	5.4%	20	11.5%
Hip/thigh/upper leg strain/sprain	3	3.0%	9	12.2%	12	6.9%
Lower leg other	1	1.0%	10	13.5%	11	6.3%
Knee other	6	6.0%	5	6.8%	11	6.3%
Head/face contusion	1	1.0%	3	4.1%	4	2.3%
Hand/wrist strain/sprain	3	3.0%	0	0.0%	3	1.7%
Foot strain/sprain	1	1.0%	2	2.7%	3	1.7%
Ankle contusion	1	1.0%	1	1.4%	2	1.1%

Figure 15.2 Time Loss of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 15.5 Girls' Lacrosse Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	11	11.1%	4	5.4%	15	8.7%
Did not require surgery	88	88.9%	69	94.5%	157	91.3%
Total	**99**	**100%**	**73**	**100%**	**172**	**100%**

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

Figure 15.3 History of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

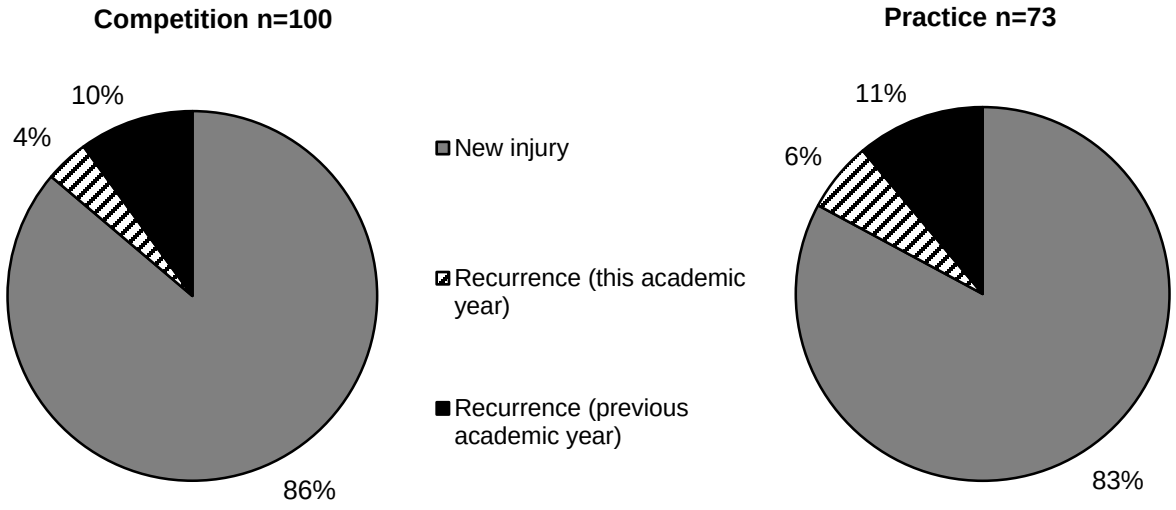


Table 15.6 Time during Season of Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	29	16.7%
Regular season	135	77.6%
Post season	10	5.7%
Total	**174**	**100%**

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

Table 15.7 Competition-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Competition		
Pre-Competition-Warm-ups	4	4.5%
First half	17	19.3%
Second half	67	76.1%
Overtime	-	0.0%
Total	**88**	**100%**
Field Location		
Midfield (between restraining lines)	42	47.7%
Critical scoring area (including the fan and arc)	22	25.0%
Goal circle	14	15.9%
Center circle	4	4.5%
Sideline	4	4.5%
Endline	2	2.3%
Total	**88**	**100%**

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

Table 15.8 Practice-Related Variables for Girls' Lacrosse Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	8	11.6%
Second 1/2 hour	18	26.1%
1-2 hours into practice	40	58.0%
>2 hours into practice	3	4.3%
Total	**69**	**100%**

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

Figure 15.4 Player Position of Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

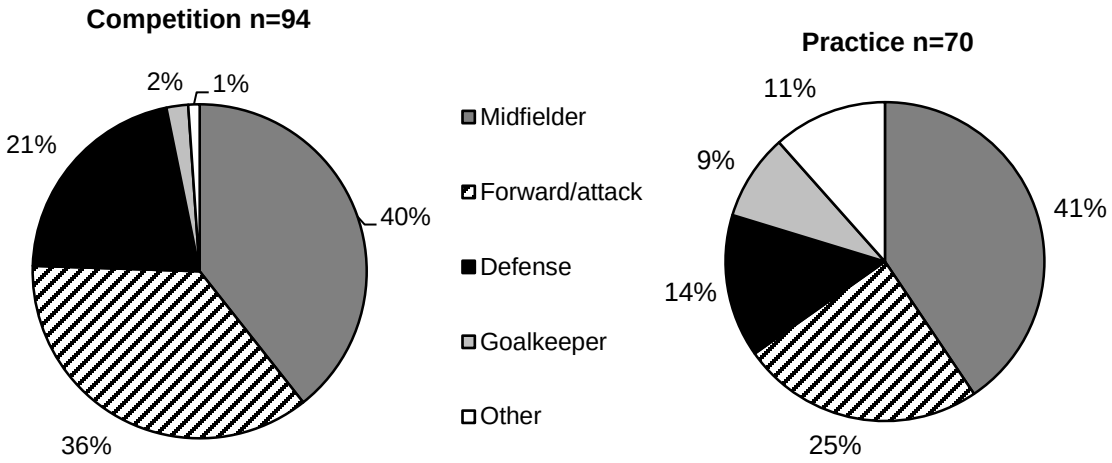


Table 15.9 Activities Leading to Girls' Lacrosse Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
General play	24	25.3%	17	24.3%	41	24.8%
Defending	19	20.0%	5	7.1%	24	14.5%
Chasing loose ball	12	12.6%	12	17.1%	24	14.5%
Ball handling/cradling	11	11.6%	3	4.3%	14	8.5%
Conditioning	0	0.0%	12	17.1%	12	7.3%
Receiving pass	5	5.3%	6	8.6%	11	6.7%
Shooting	8	8.4%	1	1.4%	9	5.5%
Being crosse/stick checked	6	6.3%	2	2.9%	8	4.8%
Passing	3	3.2%	4	5.7%	7	4.2%
Goaltending	2	2.1%	5	7.1%	7	4.2%
Crosse/stick checking	2	2.1%	0	0.0%	2	1.2%
Body checking	1	1.1%	0	0.0%	1	0.6%
Being body checked	1	1.1%	0	0.0%	1	0.6%
Face-off	1	1.1%	0	0.0%	1	0.6%
Draw	0	0.0%	1	1.4%	1	0.6%
Other	0	0.0%	2	2.9%	2	1.2%
Total	**95**	**100%**	**70**	**100%**	**165**	**100%**

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

Table 15.10 Activity Resulting in Girls' Lacrosse Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
General play	22	30.1%	0	0.0%	0	0.0%	7	12.3%	12	46.2%
Defending	11	15.1%	1	11.1%	0	0.0%	11	19.3%	1	3.8%
Ball handling/cradling	7	9.6%	0	0.0%	0	0.0%	7	12.3%	0	0.0%
Conditioning	6	8.2%	0	0.0%	0	0.0%	0	0.0%	6	23.1%
Chasing loose ball	13	17.8%	2	22.2%	0	0.0%	7	12.3%	2	7.7%
Other	14	19.2%	6	66.7%	0	0.0%	25	43.8%	5	19.2%
Total	**73**	**100%**	**9**	**100%**	0	0.0%	**57**	**100%**	**26**	**100%**

XVI. Boys' Swimming and Diving Injury Epidemiology

Table 16.1 Boys' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**17**	**89,992**	**0.19**
Competition	3	15,561	0.19
Practice	14	74,431	0.19

Table 16.2 Demographic Characteristics of Injured Boys' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=17**
Freshman	29.4%
Sophomore	29.4%
Junior	5.9%
Senior	35.3%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.4 (1.5)
BMI	
Minimum	18.1
Maximum	23.6
Mean (St. Dev.)	20.4 (1.7)

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

Figure 16.1 Diagnosis of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

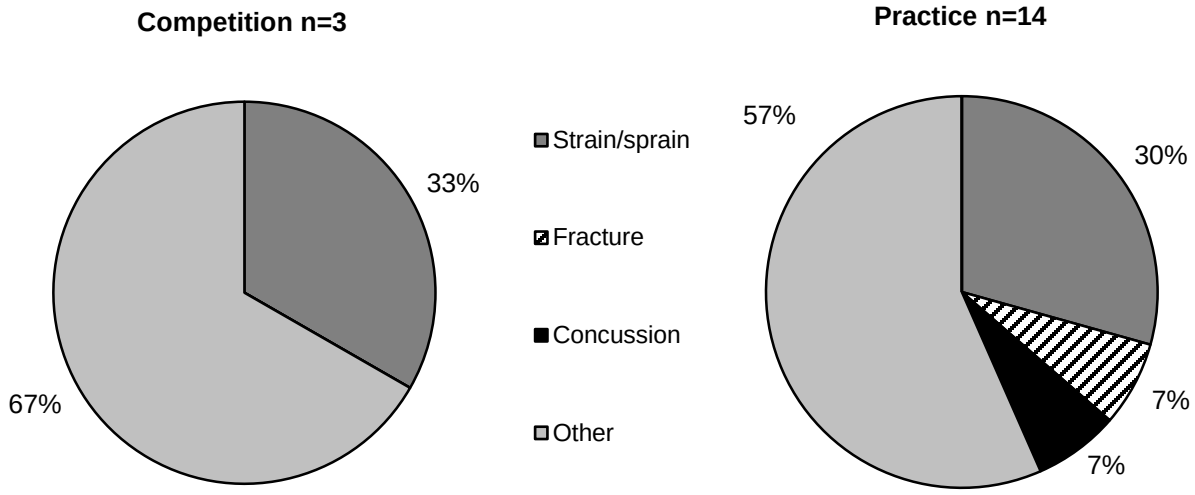


Table 16.3 Body Site of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

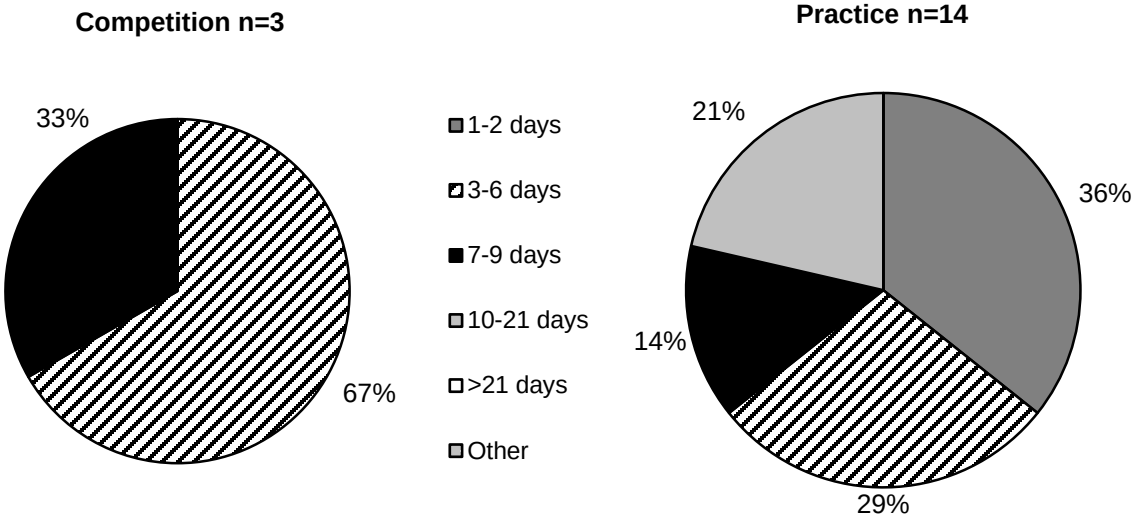
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Shoulder	2	66.7%	3	21.4%	5	29.4%
Trunk	0	0.0%	4	28.6%	4	23.5%
Knee	0	0.0%	3	21.4%	3	17.6%
Head/face	0	0.0%	2	14.3%	2	11.8%
Hip/thigh/upper leg	1	33.3%	0	0.0%	1	5.9%
Foot	0	0.0%	1	7.1%	1	5.9%
Arm/elbow	0	0.0%	1	7.1%	1	5.9%
Total	**3**	**100%**	**14**	**100%**	**17**	**100%**

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

Table 16.4 Most Common Boys' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=3		Practice n=14		Total n=17	
	n	%	n	%	n	%
Diagnosis						
Shoulder other	2	66.7%	3	21.4%	5	29.4%
Trunk strain/sprain	-	-	3	21.4%	3	17.6%
Knee other	-	-	3	21.4%	3	17.6%
Hip/thigh/upper leg strain/sprain	1	33.3%	-	-	1	5.9%
Head/face concussion	-	-	1	7.1%	1	5.9%
Foot strain/sprain	-	-	1	7.1%	1	5.9%
Arm/elbow fracture	-	-	1	7.1%	1	5.9%
Trunk other	-	-	1	7.1%	1	5.9%
Head/face other	-	-	1	7.1%	1	5.9%
Total	**3**	**100%**	**14**	**100%**	**17**	**100%**

Figure 16.2 Time Loss of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 16.5 Boys' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	---	0.0%	--	0.0%	--	0.0%
Did not require surgery	3	100.0%	14	100%	17	100%
Total	**3**	**100%**	**14**	**100%**	**17**	**100%**

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

Figure 16.3 History of Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

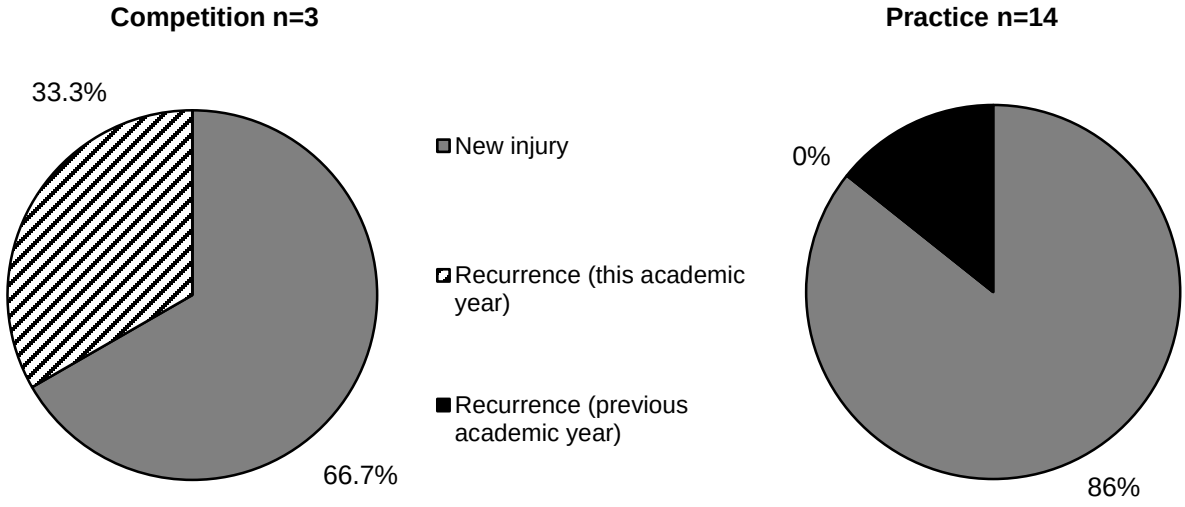


Table 16.6 Time during Season of Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	2	11.8%
Regular season	15	88.2%
Post season	-	0.0%
Total	**17**	**100%**

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

Table 16.7 Pool Location for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Pool Location		
In pool	9	69.2%
Starting platform	-	0.0%
Poolside	3	23.1%
Other	1	7.7%
Total	**13**	**100%**

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

Table 16.8 Practice-Related Variables for Boys' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	1	7.1%
Second 1/2 hour	5	35.7%
1-2 hours into practice	8	57.1%
>2 hours into practice	-	0.0%
Total	**14**	**100%**

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

Table 16.9 Activities Leading to Boys' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Swimming	2	100.0%	6	66.7%	8	72.7%
Flip turn off wall	-	0.0%	2	22.0%	2	18.2%
Diving off board/platform/block	-	0.0%	-	0.0%	-	0.0%
Touch turn off wall	-	0.0%	-	0.0%	-	0.0%
Other	0	-	1	11.1%	1	9.1%
Total	**2**	**100%**	**9**	**100%**	**11**	**100%**

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

Table 16.10 Activity Resulting in Boys' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Swimming	4	80.0%	--	--	1	100.0%	--	--	3	60.0%
Flip turn off wall	1	20.0%	--	--	0	0.0%	--	--	1	20.0%
Diving off board/platform/block	0	0.0%	--	--	0	0.0%	--	--	1	20.0%
Touch turn off wall	0	0.0%	--	--	0	0.0%	--	--	0	0.0%
Other	0	0.0%	--	--	0	0.0%	--	--	0	0.0%
Total	**5**	100%	--	--	**1**	100%	--	--	**5**	100%

XVII. Girls' Swimming and Diving Injury Epidemiology

Table 17.1 Girls' Swimming and Diving Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**21**	**97,636**	**0.22**
Competition	4	18,131	0.22
Practice	17	79,505	0.21

Table 17.2 Demographic Characteristics of Injured Girls' Swimming and Diving Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=21**
Freshman	38.1%
Sophomore	19.0%
Junior	14.3%
Senior	28.6%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.6 (1.5)
BMI	
Minimum	16.1
Maximum	33.7
Mean (St. Dev.)	22.1 (4.5)

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

Figure 17.1 Diagnosis of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

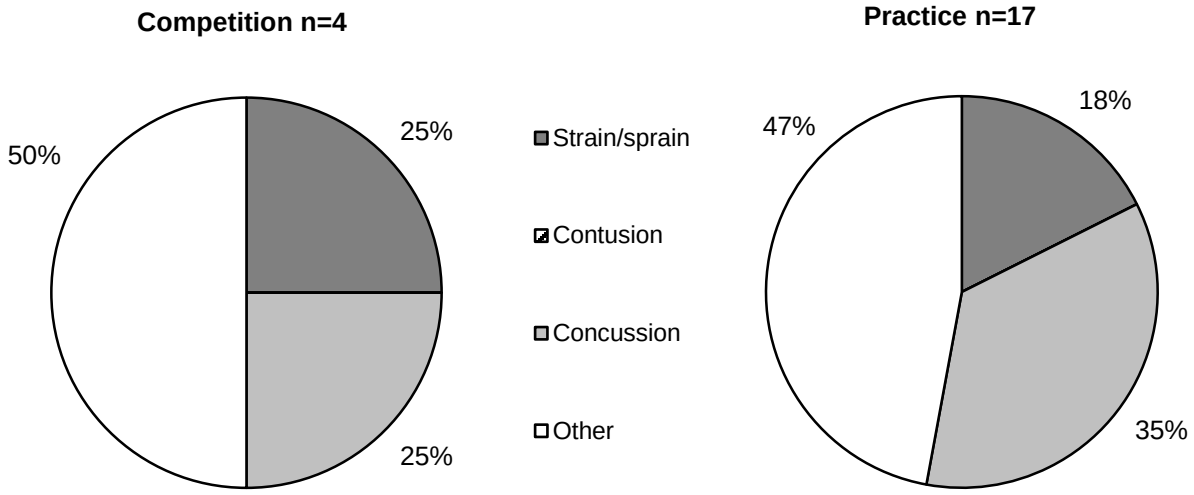


Table 17.3 Body Site of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

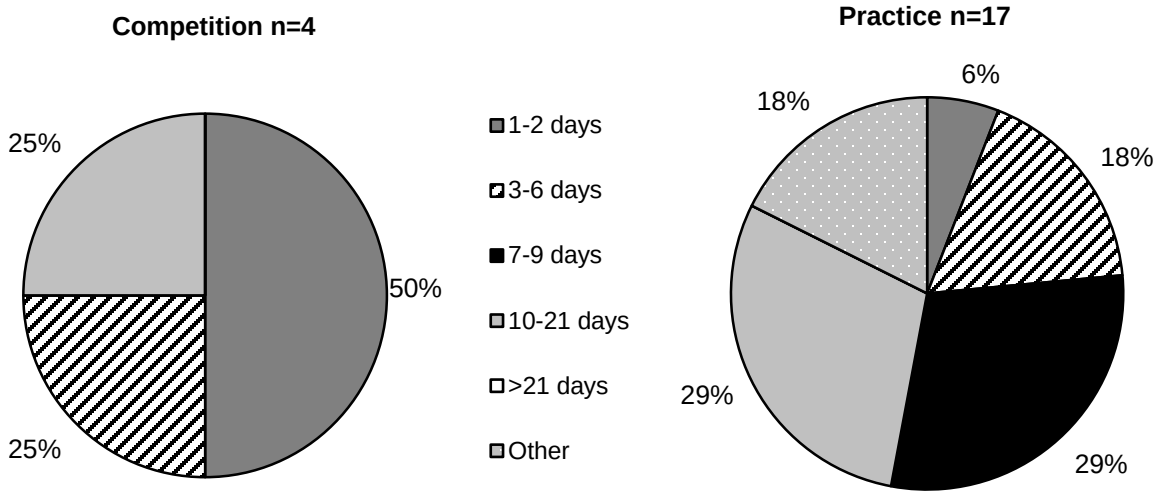
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Head/face	1	25.0%	8	47.1%	9	42.9%
Shoulder	1	25.0%	5	29.4%	6	28.6%
Foot	1	25.0%	1	5.9%	2	9.5%
Hip/thigh/upper leg	0	0.0%	1	5.9%	1	4.8%
Knee	0	0.0%	1	5.9%	1	4.8%
Trunk	0	0.0%	1	5.9%	1	4.8%
Neck	1	25.0%	0	0.0%	1	4.8%
Other	0	0.0%	0	0.0%	0	0.0%
Total	**4**	**100%**	**17**	**100%**	**21**	**100%**

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

Table 17.4 Ten Most Common Girls' Swimming and Diving Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=4		Practice n=17		Total n=21	
	n	%	n	%	n	%
Diagnosis						
Head/face concussion	1	25.0%	6	35.3%	7	33.3%
Shoulder other	1	25.0%	5	29.4%	6	28.6%
Head/face other	-	-	2	11.8%	2	9.5%
Hip/thigh/upper leg strain/sprain	-	-	1	5.9%	1	4.8%
Neck strain/sprain	1	25.0%	-	-	1	4.8%
Knee other	-	-	1	5.9%	1	4.8%
Trunk strain/sprain	-	-	1	5.9%	1	4.8%
Foot other	1	25.0%	-	-	1	4.8%
Foot strain/sprain	-	-	1	5.9%	1	4.8%

Figure 17.2 Time Loss of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 17.5 Girls' Swimming and Diving Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	0	0.0%	0	0.0%
Did not require surgery	4	100.0%	17	100.0%	21	100.0
Total	**4**	**100%**	**17**	**100%**	**21**	**100%**

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

Figure 17.3 History of Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

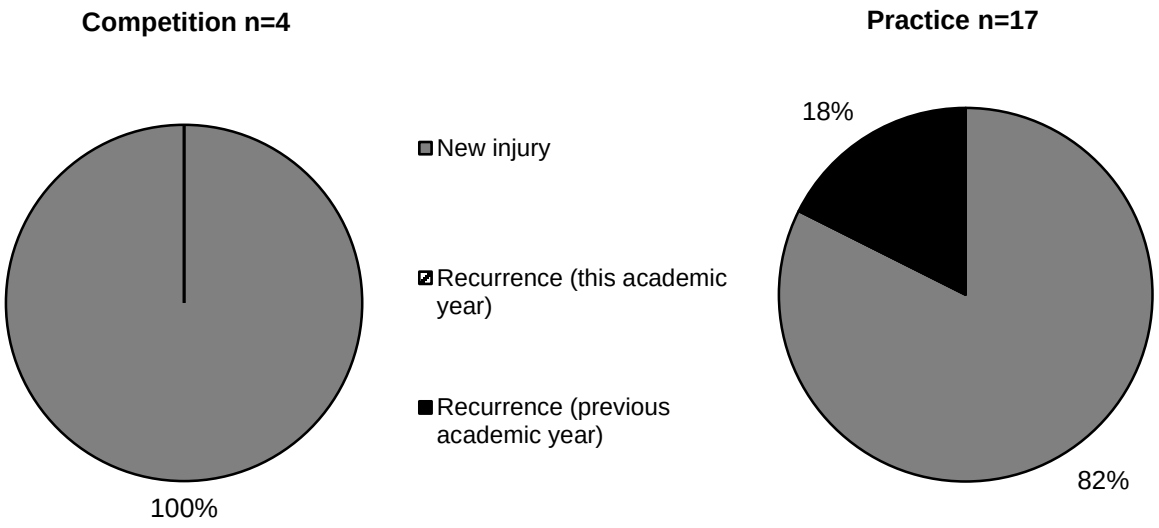


Table 17.6 Time during Season of Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	4	19.0%
Regular season	17	81.0%
Post season	-	-
Total	**21**	**100%**

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

Table 17.7 Competition-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Pool Location		
In pool	16	88.9%
Starting platform/board/blocks	-	0.0%
Poolside	2	11.1%
Other	-	0.0%
Total	**18**	**100%**

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

Table 17.8 Practice-Related Variables for Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	1	6.3%
Second 1/2 hour	5	31.3%
1-2 hours into practice	10	62.5%
>2 hours into practice	-	0.0%
Total	**16**	**100%**

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

Table 17.9 Activities Leading to Girls' Swimming and Diving Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Swimming	3	75.0%	10	71.4%	13	72.2%
Flip turn off wall	-	0.0%	1	7.1%	1	5.6%
Diving off board/platform/block	-	0.0%	3	21.4%	3	16.7%
Touch turn off wall	-	0.0%	-	0.0%	-	0.0%
Other	1	25.0%	-	0.0%	1	5.6%
Total	**4**	**100%**	**14**	**100%**	**18**	**100%**

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

Table 17.10 Activity Resulting in Girls' Swimming and Diving Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Swimming	3	75.0%	0	0%	--	--	2	33.3%	8	100.0%
Flip turn off wall	1	25.0%	0	0%	--	--	0	0%	0	0%
Diving off board/platform/block	0	0%	0	0%	--	--	3	50.0%	0	0%
Other	0	0%	0	0%	--	--	1	16.7%	0	0%
Total	**4**	**100%**	**0**	**0%**	**--**	**--**	**6**	**100%**	**8**	**100%**

XVIII. Boys' Track and Field Injury Epidemiology

Table 18.1 Boys' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**198**	**282,910**	**0.70**
Competition	72	53,030	1.36
Practice	126	229,880	0.55

Table 18.2 Demographic Characteristics of Injured Boys' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=189**
Freshman	19.6%
Sophomore	27.5%
Junior	25.4%
Senior	27.5%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.1 (1.3)
BMI	
Minimum	17.3
Maximum	34.9
Mean (St. Dev.)	22.8 (3.0)

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

Figure 18.1 Diagnosis of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

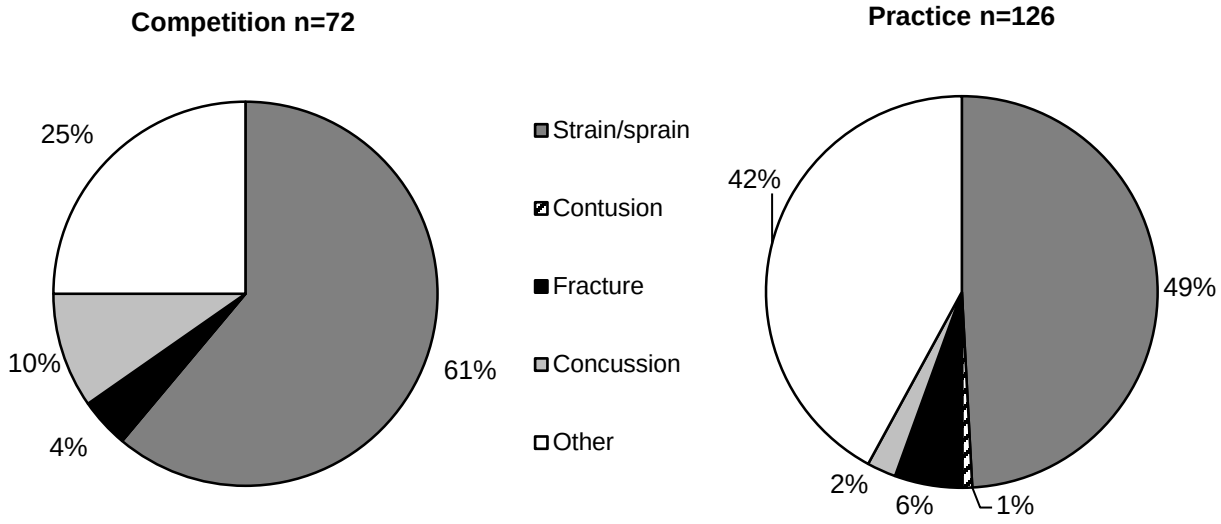


Table 18.3 Body Site of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

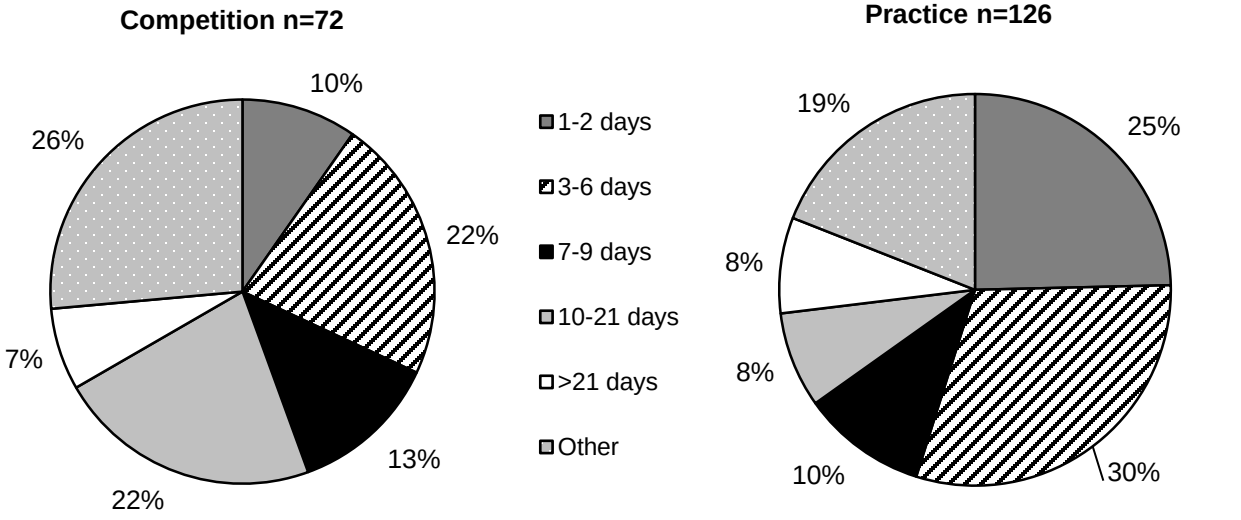
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Hip/thigh/upper leg	38	52.8%	39	31.0%	77	38.9%
Lower leg	3	4.2%	33	26.2%	36	18.2%
Ankle	8	11.1%	10	7.9%	18	9.1%
Knee	3	4.2%	14	11.1%	17	8.6%
Head/face	9	12.5%	5	4.0%	14	7.1%
Trunk	2	2.8%	8	6.3%	10	5.1%
Foot	3	4.2%	6	4.8%	9	4.5%
Shoulder	2	2.8%	4	3.2%	6	3.0%
Arm/elbow	2	2.8%	3	2.4%	5	2.5%
Hand/wrist	1	1.4%	2	1.6%	3	1.5%
Other	1	1.4%	2	1.6%	3	1.5%
Total	**72**	**100%**	**126**	**100%**	**198**	**100%**

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

Table 18.4 Ten Most Common Boys' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=72		Practice n=126		Total n=198	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	30	41.7%	34	27.0%	64	32.3%
Lower leg other	0	0.0%	26	20.6%	26	13.1%
Ankle strain/sprain	7	9.7%	8	6.3%	15	7.6%
Knee other	2	2.8%	11	8.7%	13	6.6%
Hip/thigh/upper leg other	8	11.1%	3	2.4%	11	5.6%
Head/face concussion	7	9.7%	3	2.4%	10	5.1%
Lower leg strain/sprain	2	2.8%	6	4.8%	8	4.0%
Trunk strain/sprain	2	2.8%	5	4.0%	7	3.5%
Foot other	2	2.8%	3	2.4%	5	2.5%
Head/face other	2	2.8%	2	1.6%	4	2.0%

Figure 18.2 Time Loss of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 18.5 Boys' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	3	4.2%	6	4.8%	9	4.6%
Did not require surgery	69	95.8%	119	95.2%	188	95.4%
Total	**72**	**100%**	**125**	**100%**	**197**	**100%**

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

Figure 18.3 History of Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

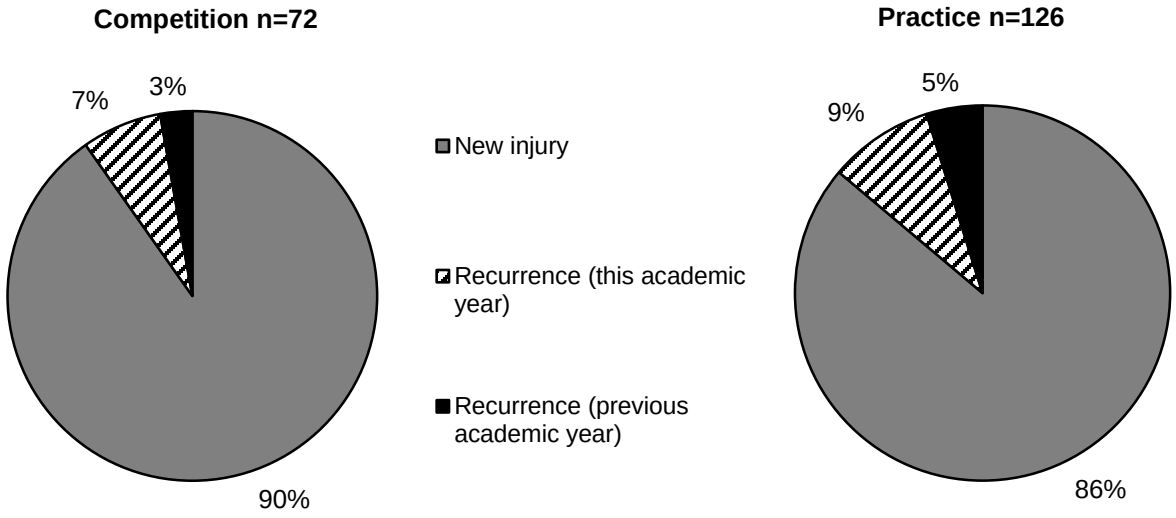


Table 18.6 Time during Season of Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	36	18.2%
Regular season	154	77.8%
Post season	8	4.0%
Total	**198**	**100%**

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

Table 18.7 Practice-Related Variables for Boys' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	14	13.0%
Second 1/2 hour	30	27.8%
1-2 hours into practice	59	54.6%
>2 hours into practice	5	4.6%
Total	**108**	**100%**

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

Table 18.8 Activities Leading to Boys' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	41	60.3%	74	64.9%	115	63.2%
Running hurdles	12	17.6%	6	5.3%	18	9.9%
Jumping/landing	6	8.8%	12	10.5%	18	9.9%
Conditioning	0	0.0%	12	10.5%	12	6.6%
Throwing	4	5.9%	5	4.4%	9	4.9%
Baton hand off	3	4.4%	0	0.0%	3	1.6%
Warming up	0	0.0%	2	1.8%	2	1.1%
Leaving block	1	1.5%	1	0.9%	2	1.1%
Other	1	1.5%	2	1.8%	3	1.6%
Total	**68**	**100%**	**114**	**100%**	**182**	**100%**

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

Table 18.10 Activity Resulting in Boys' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	67	69.1%	0	0.0%	2	25.0%	2	20.0%	44	65.7%
Jumping/landing	6	6.2%	0	0.0%	3	37.5%	4	40.0%	5	7.5%
Throwing	8	8.2%	0	0.0%	0	0.0%	0	0.0%	1	1.5%
Running hurdles	8	8.2%	0	0.0%	3	37.5%	3	30.0%	4	6.0%
Conditioning	4	4.1%	0	0.0%	0	0.0%	1	10.0%	7	10.4%
Other	4	4.2%	0	0.0%	0	0.0%	0	0.0%	6	8.9%
Total	**97**	**100%**	**0**	**100%**	**8**	**100%**	**10**	**100%**	**67**	**100%**

XIX. Girls' Track and Field Injury Epidemiology

Table 19.1 Girls' Track and Field Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**215**	**234,060**	**0.92**
Competition	54	43,963	1.23
Practice	161	190,097	0.85

Table 19.2 Demographic Characteristics of Injured Girls' Track and Field Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=209**
Freshman	31.1%
Sophomore	27.8%
Junior	20.1%
Senior	21.1%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.8 (1.2)
BMI	
Minimum	16.3
Maximum	41.8
Mean (St. Dev.)	21.4 (4.0)

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

Figure 19.1 Diagnosis of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

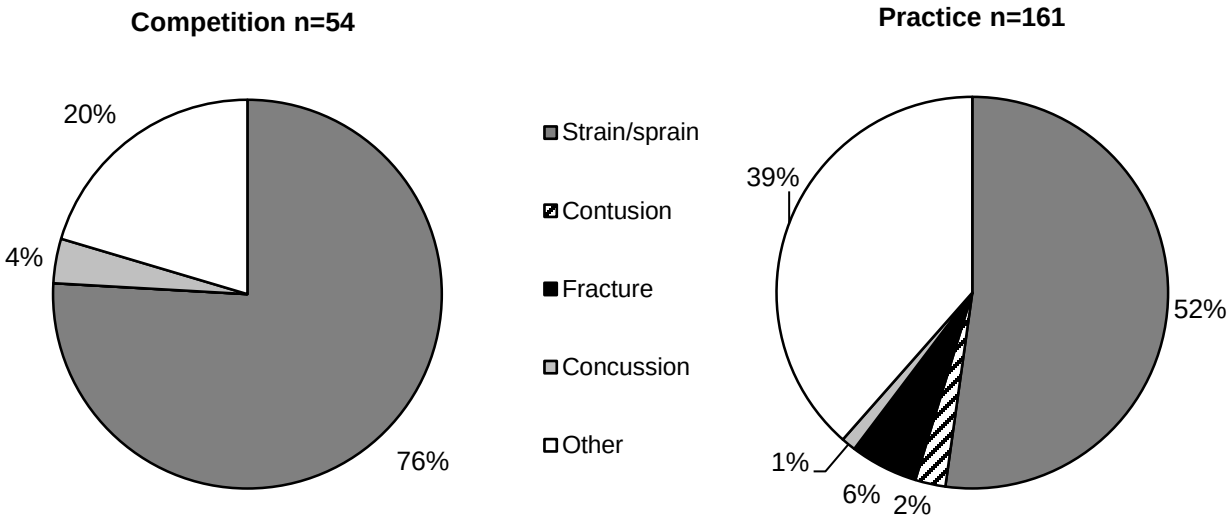


Table 19.3 Body Site of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

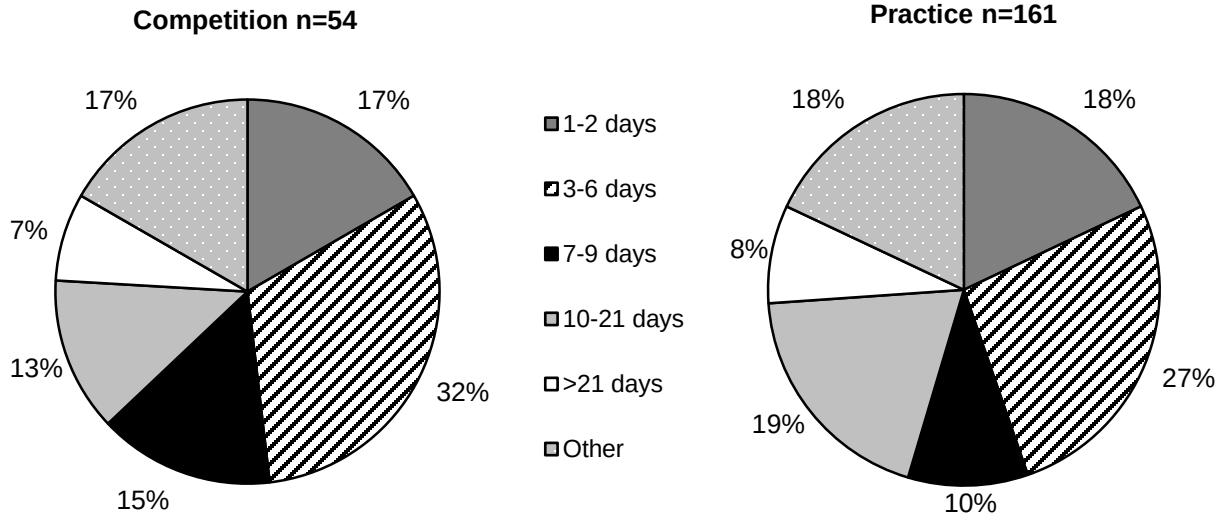
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Hip/thigh/upper leg	27	50.0%	52	32.7%	79	37.1%
Lower leg	7	13.0%	33	20.8%	40	18.8%
Knee	5	9.3%	25	15.7%	30	14.1%
Ankle	10	18.5%	14	8.8%	24	11.3%
Foot	0	0.0%	14	8.8%	14	6.6%
Trunk	2	3.7%	7	4.4%	9	4.2%
Head/face	2	3.7%	2	1.3%	4	1.9%
Shoulder	0	0.0%	4	2.5%	4	1.9%
Hand/wrist	1	1.9%	2	1.3%	3	1.4%
Arm/elbow	0	0.0%	3	1.9%	3	1.4%
Other	0	0.0%	3	1.9%	3	1.4%
Total	**54**	**100%**	**159**	**100%**	**213**	**100%**

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

Table 19.4 Ten Most Common Girls' Track and Field Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=54		Practice n=159		Total n=213	
	n	%	n	%	n	%
Diagnosis						
Hip/thigh/upper leg strain/sprain	25	46.3%	45	28.3%	70	32.9%
Lower leg other	5	9.3%	25	15.7%	30	14.1%
Ankle strain/sprain	10	18.5%	13	8.2%	23	10.8%
Knee other	3	5.6%	17	10.7%	21	9.9%
Lower leg strain/sprain	2	3.7%	7	4.4%	9	4.2%
Hip/thigh/upper leg other	2	3.7%	7	4.4%	9	4.2%
Knee strain/sprain	2	3.7%	5	3.1%	7	3.3%
Trunk strain/sprain	1	1.9%	4	2.5%	5	2.3%
Foot fracture	0	0.0%	5	3.1%	5	2.3%
Foot other	0	0.0%	5	3.1%	5	2.3%

Figure 19.2 Time Loss of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 19.5 Girls' Track and Field Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	3	5.7%	5	3.1%	8	3.8%
Did not require surgery	50	94.3%	155	96.9%	205	96.2%
Total	**53**	**100%**	**160**	**100%**	**213**	**100%**

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

Figure 19.3 History of Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

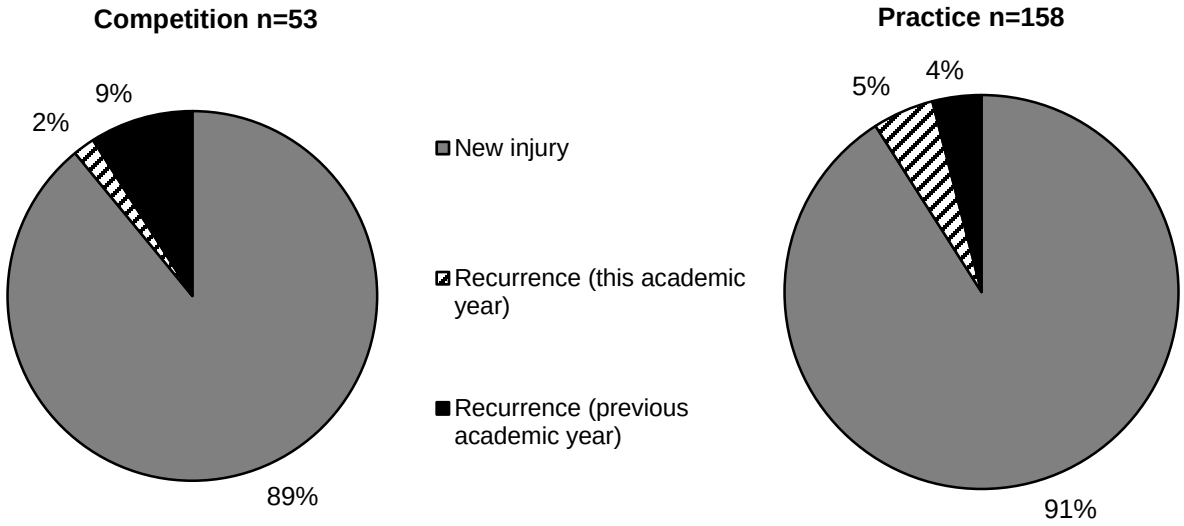


Table 19.6 Time during Season of Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	62	28.8%
Regular season	150	69.8%
Post season	3	1.4%
Total	**215**	**100%**

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

Table 19.7 Practice-Related Variables for Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	16	10.5%
Second 1/2 hour	46	30.1%
1-2 hours into practice	86	56.2%
>2 hours into practice	5	3.3%
Total	**153**	**100%**

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

Table 19.8 Activities Leading to Girls' Track and Field Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	26	50.0%	105	69.5%	131	64.5%
Jumping/landing	12	23.1%	15	9.9%	27	13.3%
Running hurdles	5	9.6%	7	4.6%	12	5.9%
Throwing	4	7.7%	6	4.0%	10	4.9%
Warming up	3	5.8%	5	3.3%	8	3.9%
Conditioning	0	0.0%	8	5.3%	8	3.9%
Leaving block	2	3.8%	1	0.7%	3	1.5%
Other	0	0.0%	4	2.6%	4	2.0%
Total	**52**	**100%**	**151**	**100%**	**203**	**100%**

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

Table 19.10 Activity Resulting in Girls' Track and Field Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	76	67.3%	1	25.0%	4	44.4%	0	0.0%	50	78.1%
Jumping/landing	13	11.5%	1	25.0%	1	11.1%	2	66.7%	10	15.6%
Running hurdles	8	7.1%	1	25.0%	2	22.2%	0	0.0%	1	1.6%
Conditioning	5	4.4%	0	0.0%	0	0.0%	1	33.3%	2	3.1%
Warming up	6	5.3%	0	0.0%	2	22.2%	0	0.0%	0	0.0%
Other	5	4.4%	1	25.0%	0	0.0%	0	0.0%	1	1.6%
Total	**113**	**100%**	**4**	**100%**	**9**	**100%**	**3**	**100%**	**64**	**100%**

XX. Boys' Cross Country Injury Epidemiology

Table 20.1 Boys' Cross Country Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**86**	**139,338**	**0.62**
Competition	16	22,798	0.70
Practice	70	116,540	0.60

Table 20.2 Demographic Characteristics of Injured Boys' Cross Country Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=81**
Freshman	27.2%
Sophomore	22.2%
Junior	18.5%
Senior	32.1%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	15.9 (1.4)
BMI	
Minimum	15.7
Maximum	31.9
Mean (St. Dev.)	21.4 (3.3)

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

Figure 20.1 Diagnosis of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

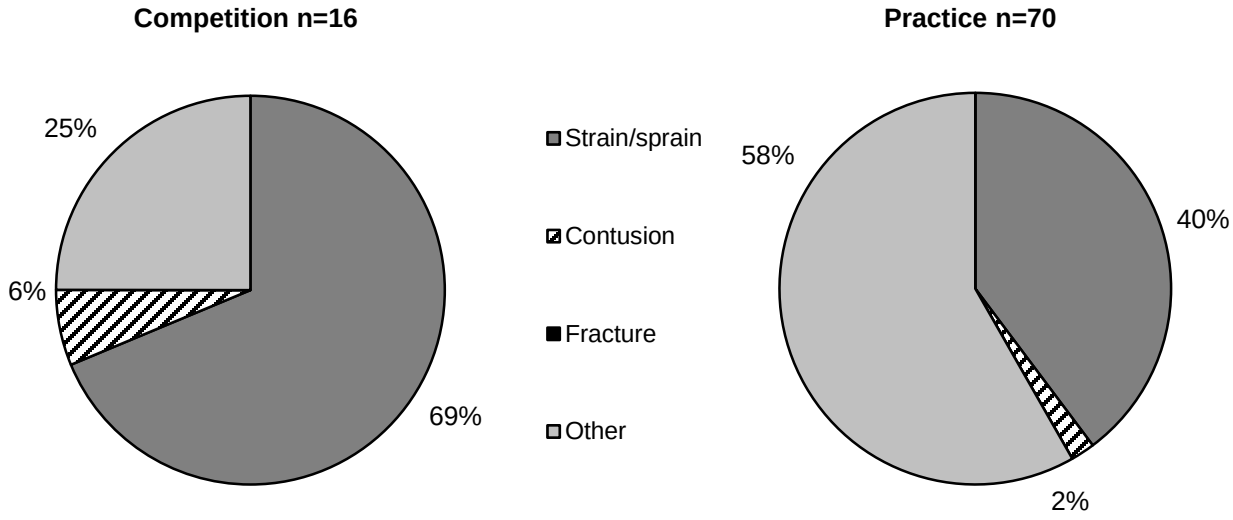


Table 20.3 Body Site of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

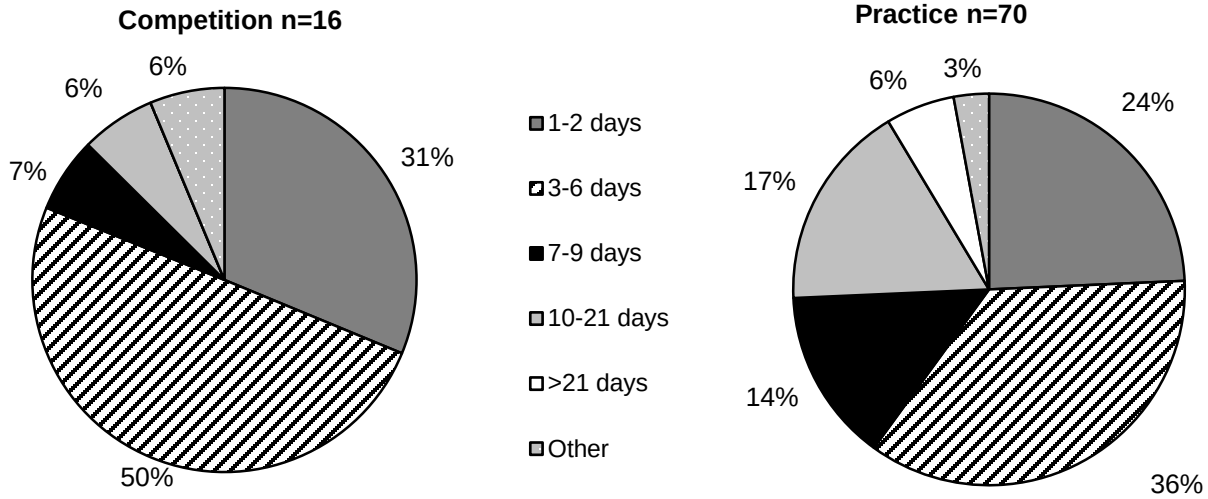
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Lower leg	4	26.7%	19	27.1%	23	27.1%
Hip/thigh/upper leg	4	26.7%	18	25.7%	22	25.9%
Knee	2	13.3%	18	25.7%	20	23.5%
Foot	1	6.7%	7	10.0%	8	9.4%
Ankle	2	13.3%	5	7.1%	7	8.2%
Trunk	0	0.0%	3	4.3%	3	3.5%
Other	2	13.3%	0	0.0%	2	2.4%
Total	**15**	**100%**	**70**	**100%**	**85**	**100%**

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

Table 20.4 Ten Most Common Boys' Cross Country Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=15		Practice n=70		Total n=85	
	n	%	n	%	n	%
Diagnosis						
Knee other	1	6.7%	16	22.9%	17	20.0%
Hip/thigh/upper leg strain/sprain	3	20.0%	12	17.1%	15	17.6%
Lower leg other	0	0.0%	14	20.0%	14	16.5%
Lower leg strain/sprain	4	26.7%	5	7.1%	9	10.6%
Ankle strain/sprain	2	13.3%	4	5.7%	6	7.1%
Hip/thigh/upper leg other	0	0.0%	6	8.6%	6	7.1%
Foot other	0	0.0%	4	5.7%	4	4.7%
Trunk strain/sprain	0	0.0%	3	4.3%	3	3.5%
Foot strain/sprain	1	6.7%	2	2.9%	3	3.5%
Knee strain/sprain	1	6.7%	2	2.9%	3	3.5%

Figure 20.2 Time Loss of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 20.5 Boys' Cross Country Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	--	--	--	--	--	--
Did not require surgery	16	100.0%	70	100.0%	86	100.0%
Total	**16**	**100%**	**70**	**100%**	**86**	**100%**

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

Figure 20.3 History of Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

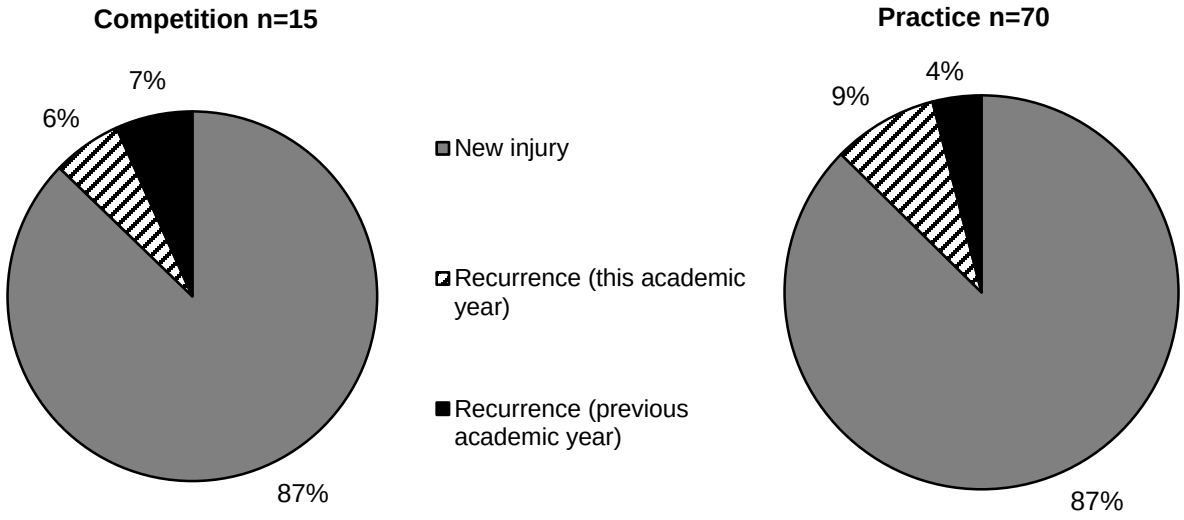


Table 20.6 Time during Season of Boys' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	16	18.8%
Regular season	69	81.2%
Post season	-	0.0%
Total	**85**	**100%**

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

Table 20.7 Practice-Related Variables for Boys' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	10	15.6%
Second 1/2 hour	20	31.3%
1-2 hours into practice	31	46.9%
>2 hours into practice	4	6.3%
Total	**65**	**100%**

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

Table 20.8 Activities Leading to Boys' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	15	100.0%	56	88.9%	71	91.0%
Conditioning	--	0.0%	6	9.5%	6	7.7%
Warming up	--	0.0%	--	0.0%	--	0.0%
Cooling down	--	0.0%	--	0.0%	--	0.0%
Other	--	0.0%	1	1.6%	1	1.3%
Total	**15**	**100%**	**63**	**100%**	**78**	**100%**

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

Table 20.10 Activity Resulting in Boys' Cross Country Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	32	97.0%	2	100.0%	--	--	--	--	37	86.0%
Conditioning	1	3.0%	0	0.0%	--	--	--	--	5	11.6%
Other	0	0.0%	0	0.0%	--	--	--	--	1	2.3%
Total	**33**	**100.0%**	**2**	**100.0%**	**--**	**--**	**--**	**--**	**43**	**100%**

XXI. Girls' Cross Country Injury Epidemiology

Table 21.1 Girls' Cross Country Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**138**	**120,413**	**1.15**
Competition	31	19,792	1.57
Practice	107	100,621	1.06

Table 21.2 Demographic Characteristics of Injured Girls' Cross Country Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=133**
Freshman	26.3%
Sophomore	27.1%
Junior	30.8%
Senior	15.8%
Total†	**100%**
Age (years)	
Minimum	13
Maximum	18
Mean (St. Dev.)	15.5 (1.1)
BMI	
Minimum	16.4
Maximum	29.2
Mean (St. Dev.)	21.4 (2.7)

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

Figure 21.1 Diagnosis of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

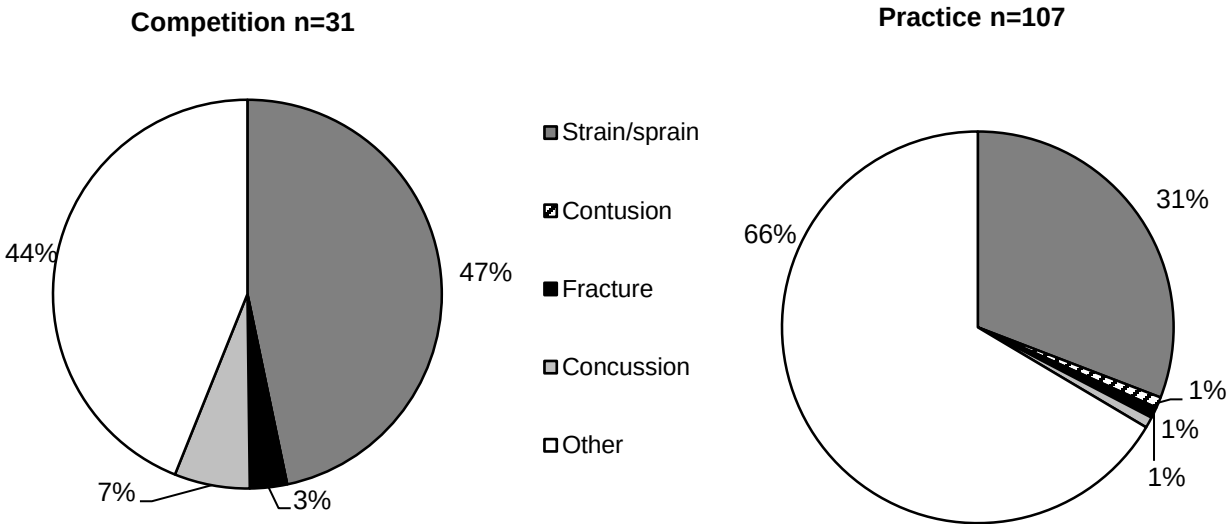


Table 21.3 Body Site of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

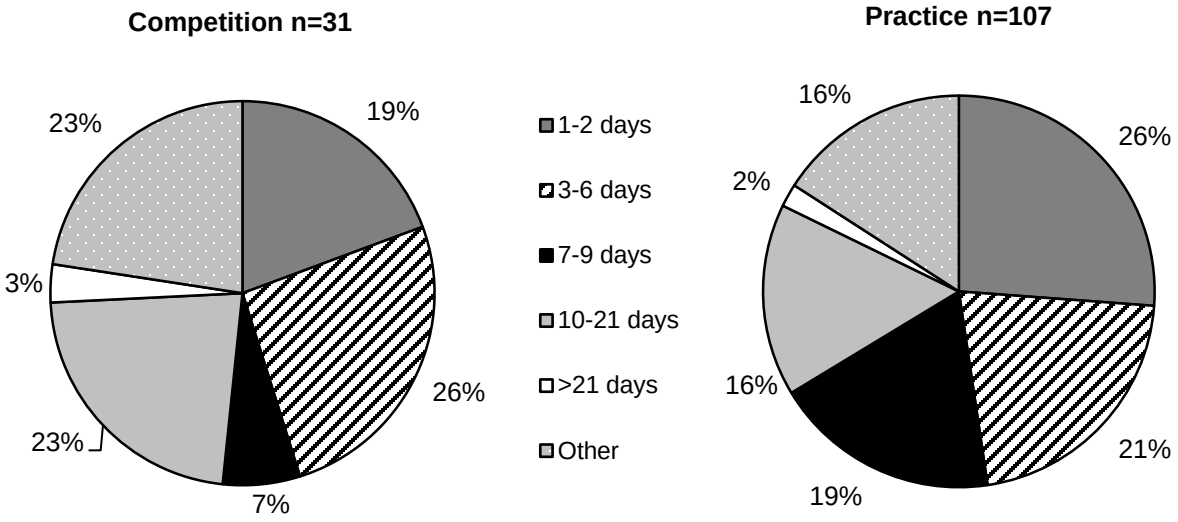
	Competition		Practice		Overall	
	n	%	n	%	n	%
Body Site						
Hip/thigh/upper leg	3	9.7%	28	26.2%	31	22.5%
Lower leg	5	16.1%	24	22.4%	29	21.0%
Knee	4	12.9%	19	17.8%	23	16.7%
Ankle	8	25.8%	11	10.3%	19	13.8%
Foot	2	6.5%	17	15.9%	19	13.8%
Trunk	2	6.5%	4	3.7%	6	4.3%
Head/face	3	9.7%	1	0.9%	4	2.9%
Other	4	12.9%	3	2.8%	7	5.1%
Total	**31**	**100%**	**107**	**100%**	**138**	**100%**

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

Table 21.4 Ten Most Common Girls' Cross Country Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=31		Practice n=107		Total n=138	
	n	%	n	%	n	%
Diagnosis						
Lower leg other	2	6.5%	21	19.6%	23	16.7%
Knee other	2	6.5%	16	15.0%	18	13.0%
Hip/thigh/upper leg strain/sprain	1	3.2%	16	15.0%	17	12.3%
Foot other	2	6.5%	14	13.1%	16	11.6%
Ankle strain/sprain	7	22.6%	7	6.5%	14	10.1%
Hip/thigh/upper leg other	1	3.2%	12	11.2%	13	9.4%
Other other	4	12.9%	3	2.8%	7	5.1%
Lower leg strain/sprain	3	9.7%	3	2.8%	6	4.3%
Trunk strain/sprain	2	6.5%	3	2.8%	5	3.6%
Ankle other	1	3.2%	4	3.7%	5	3.6%

Figure 21.2 Time Loss of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 21.5 Girls' Cross Country Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	3.2%	2	1.9%	3	2.2%
Did not require surgery	30	96.8%	105	98.1%	135	97.8%
Total	**31**	**100%**	**107**	**100%**	**138**	**100%**

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

Figure 21.3 History of Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

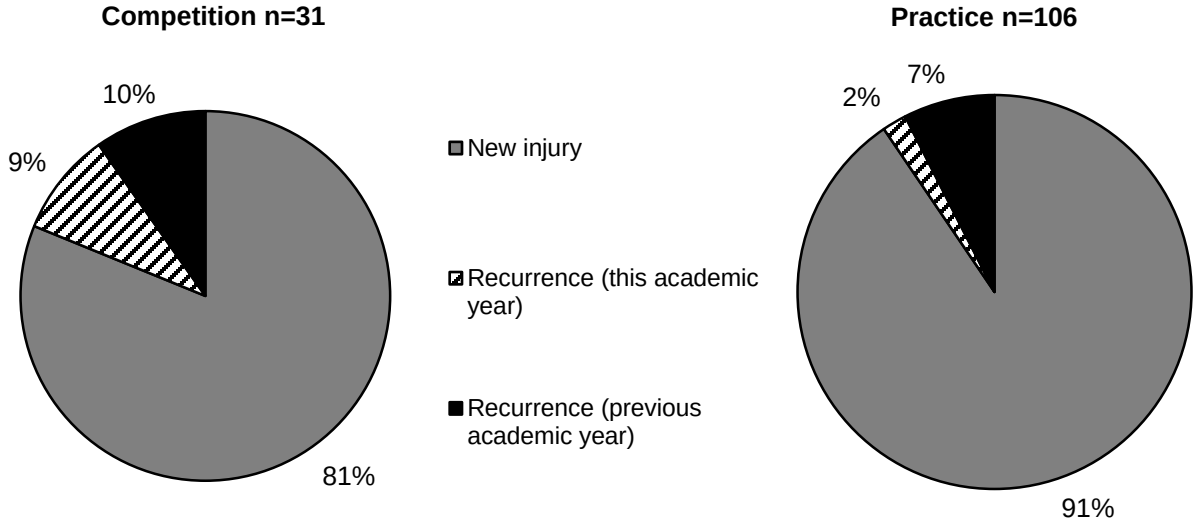


Table 21.6 Time during Season of Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	23	16.8%
Regular season	113	82.5%
Post season	1	0.7%
Total	**137**	**100%**

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

Table 21.7 Practice-Related Variables for Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	12	12.4%
Second 1/2 hour	31	32.0%
1-2 hours into practice	44	45.4%
>2 hours into practice	10	10.3%
Total	**97**	**100%**

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

Table 21.8 Activities Leading to Girls' Cross Country Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running	28	93.3%	87	87.0%	115	88.5%
Conditioning	1	3.3%	8	8.0%	9	6.9%
Warming up	0	0.0%	3	3.0%	3	2.3%
Cooling down	1	3.3%	2	2.0%	3	2.3%
Other	-	-	-	-	-	-
Total	**30**	**100%**	**100**	**100%**	**130**	**100%**

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

Table 21.9 Activity Resulting in Girls' Cross Country Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Running	41	91.1%	1	100.0%	2	100.0%	2	66.7%	69	87.3%
Warming up	1	2.2%	0	0.0%	0	0.0%	1	33.3%	1	1.3%
Conditioning	2	4.4%	0	0.0%	0	0.0%	0	0.0%	7	8.9%
Cooling down	1	2.2%	0	0.0%	0	0.0%	0	0.0%	2	2.5%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	**45**	**100%**	**1**	**100%**	**2**	**100%**	**3**	**100%**	**79**	**100%**

XXII. Boys' Tennis Injury Epidemiology

Table 22.1 Boys' Tennis Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**12**	**57,629**	**0.21**
Competition	8	17,313	0.46
Practice	4	40,316	0.10

Table 22.2 Demographic Characteristics of Injured Boys' Tennis Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=12**
Freshman	16.7%
Sophomore	0.0%
Junior	25.0%
Senior	58.3%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	19
Mean (St. Dev.)	16.8 (1.4)
BMI	
Minimum	22.0
Maximum	24.2
Mean (St. Dev.)	23.3 (0.8)

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

Figure 22.1 Diagnosis of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

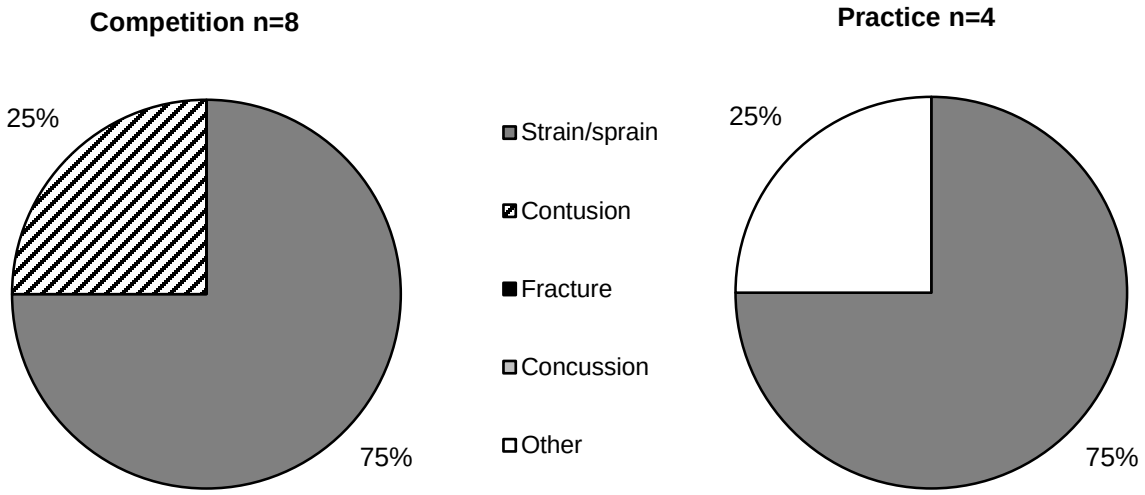


Table 22.3 Body Site of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

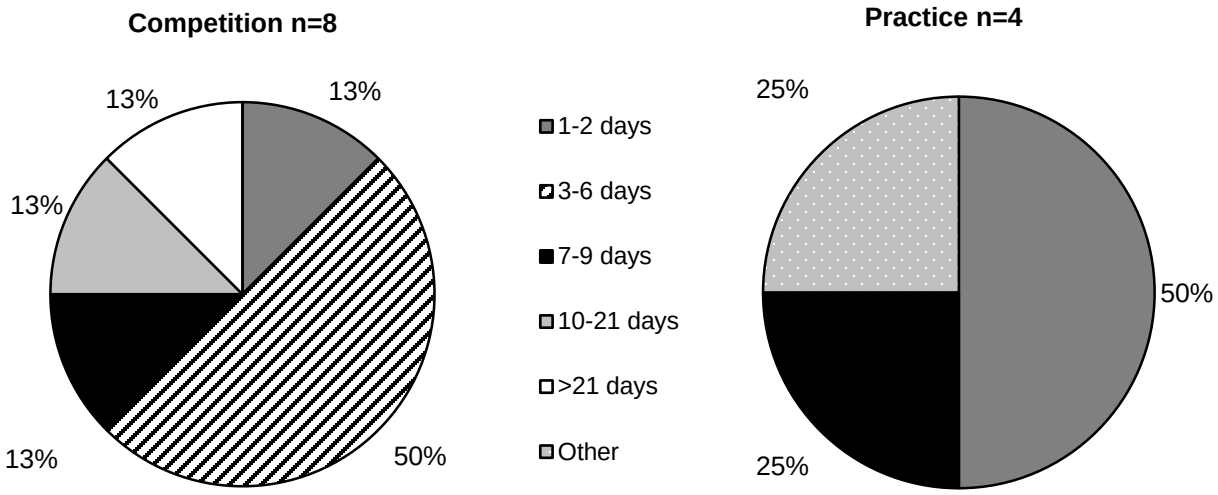
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	3	37.5%	1	25.0%	4	33.3%
Knee	1	12.5%	1	25.0%	2	16.7%
Trunk	0	0.0%	1	25.0%	1	8.3%
Hand/wrist	1	12.5%	1	25.0%	2	16.7%
Foot	1	12.5%	0	0.0%	1	8.3%
Lower leg	1	12.5%	0	0.0%	1	8.3%
Arm/elbow	1	12.5%	0	0.0%	1	8.3%
Total	**8**	**100%**	**4**	**100%**	**12**	**100%**

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

Table 22.4 Ten Most Common Boys' Tennis Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=8		Practice n=4		Total n=12	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	3	37.5%	1	25.0%	4	33.3%
Knee strain/sprain	1	12.5%	1	25.0%	2	16.7%
Trunk strain/sprain	-	-	1	25.0%	1	8.3%
Foot strain/sprain	1	12.5%	-	-	1	8.3%
Arm/elbow strain/sprain	1	12.5%	-	-	1	8.3%
Hand/wrist contusion	1	12.5%	-	-	1	8.3%
Lower leg contusion	1	12.5%	-	-	1	8.3%
Hand/wrist other	-	-	1	25.0%	1	8.3%

Figure 22.2 Time Loss of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year



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

Table 22.5 Boys' Tennis Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	0	0.0%	0	0.0%	0	0.0%
Did not require surgery	8	100.0%	4	100.0%	12	100.0%
Total	**8**	**100%**	**4**	**100%**	**12**	**100%**

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

Figure 22.3 History of Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

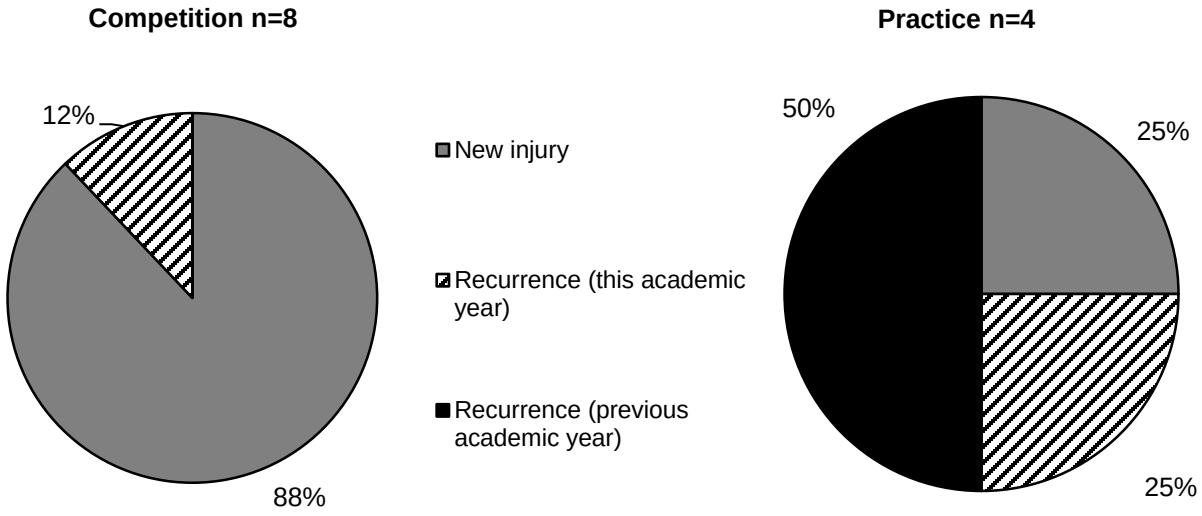


Table 22.6 Time during Season of Boys' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	1	8.3%
Regular season	11	91.7%
Post season	0	0.0%
Total	**12**	**100%**

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

Table 22.7 Practice-Related Variables for Boys' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	0	0.0%
Second 1/2 hour	0	0.0%
1-2 hours into practice	4	100.0%
>2 hours into practice	0	0.0%
Total	**4**	**100%**

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

Table 22.8 Activities Leading to Boys' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Running to hit ball	5	83.3%	1	25.0%	6	60.0%
Serve	0	0.0%	1	25.0%	1	10.0%
General play	0	0.0%	1	25.0%	1	10.0%
Forehand ground stroke	1	16.7%	0	0.0%	1	10.0%
Backhand ground stroke	0	0.0%	1	25.0%	1	10.0%
Other	0	0.0%	0	0.0%	0	0.0%
Total	**6**	**100%**	**4**	**100%**	**10**	**100%**

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

Table 22.9 Activity Resulting in Boys' Tennis Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis					
	Strain/Sprain		Contusion		Other	
	n	%	n	%	n	%
Activity						
Serve	1	12.5%	0	0.0%	0	0.0%
Running to hit ball	4	50.0%	2	100.0%	0	0.0%
Forehand ground stroke	1	12.5%	0	0.0%	0	0.0%
Backhand volley	1	12.5%	0	0.0%	0	0.0%
Other	1	12.5%	0	0.0%	1	100.0%
Total	**8**	**100%**	**2**	**100%**	**1**	**100%**

*no fractures or concussions reported

XXIII. Girls' Tennis Injury Epidemiology

Table 23.1 Girls' Tennis Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**35**	**63,427**	**0.55**
Competition	12	19,336	0.62
Practice	23	44,091	0.52

Table 23.2 Demographic Characteristics of Injured Girls' Tennis Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=34**
Freshman	8.8%
Sophomore	20.6%
Junior	29.4%
Senior	41.2%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	16.3 (1.1)
BMI	
Minimum	18.2
Maximum	16.6
Mean (St. Dev.)	23.4 (2.6)

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

Figure 23.1 Diagnosis of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

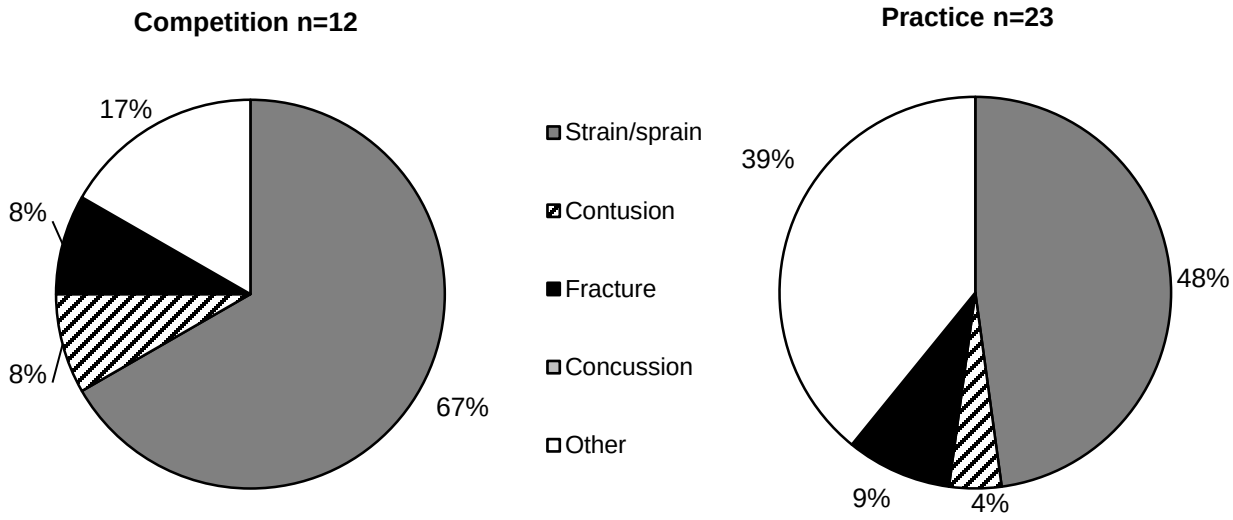


Table 23.3 Body Site of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

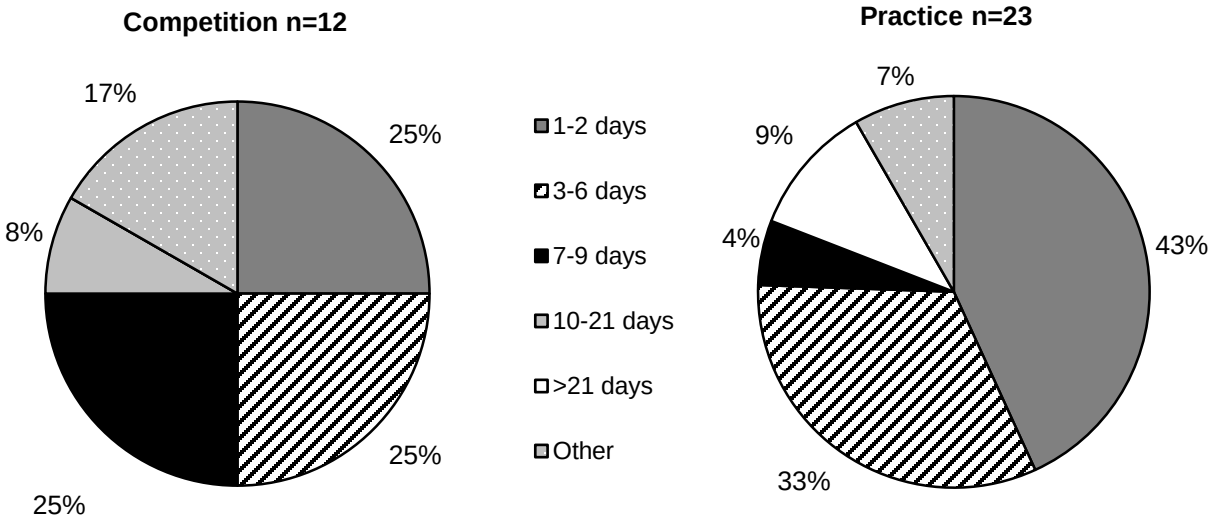
	Competition		Practice		Overall	
	n	**%**	**n**	**%**	**n**	**%**
Body Site						
Ankle	4	33.3%	5	21.7%	9	25.7%
Hand/wrist	1	8.3%	5	21.7%	6	17.1%
Lower leg	1	8.3%	4	17.4%	5	14.3%
Knee	1	8.3%	3	13.0%	4	11.4%
Trunk	2	16.7%	1	4.3%	3	8.6%
Shoulder	2	16.7%	1	4.3%	3	8.6%
Hip/thigh/upper leg	0	0.0%	2	8.7%	2	5.7%
Head/face	1	8.3%	0	0.0%	1	2.9%
Foot	0	0.0%	1	4.3%	1	2.9%
Arm/elbow	0	0.0%	1	4.3%	1	2.9%
Other	0	0.0%	0	0.0%	0	0.0%
Total	**12**	**100%**	**22**	**100%**	**34**	**100%**

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

Table 23.4 Ten Most Common Girls' Tennis Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=12		Practice n=23		Total n=35	
	n	%	n	%	n	%
Diagnosis						
Ankle strain/sprain	4	33.3%	5	21.7%	9	25.7%
Hand/wrist strain/sprain	1	8.3%	2	8.7%	3	8.6%
Knee other	1	8.3%	2	8.7%	3	8.6%
Hand/wrist other	-	-	3	13.0%	3	8.6%
Trunk strain/sprain	2	16.7%	-	-	2	5.7%
Lower leg strain/sprain	-	-	2	8.7%	2	5.7%
Shoulder strain/sprain	1	8.3%	1	4.3%	2	5.7%
Lower leg fracture	1	8.3%	1	4.3%	2	5.7%
Knee strain/sprain	-	-	1	4.3%	1	2.9%
Head/face contusion	1	8.3%	-	-	1	2.9%

Figure 23.2 Time Loss of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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 23.5 Girls' Tennis Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Need for surgery						
Required surgery	1	9.1%	0	0.0%	1	3.0%
Did not require surgery	10	90.9%	22	100.0%	32	97.0%
Total	**11**	**100%**	**22**	**100%**	**33**	**100%**

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

Figure 23.3 History of Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

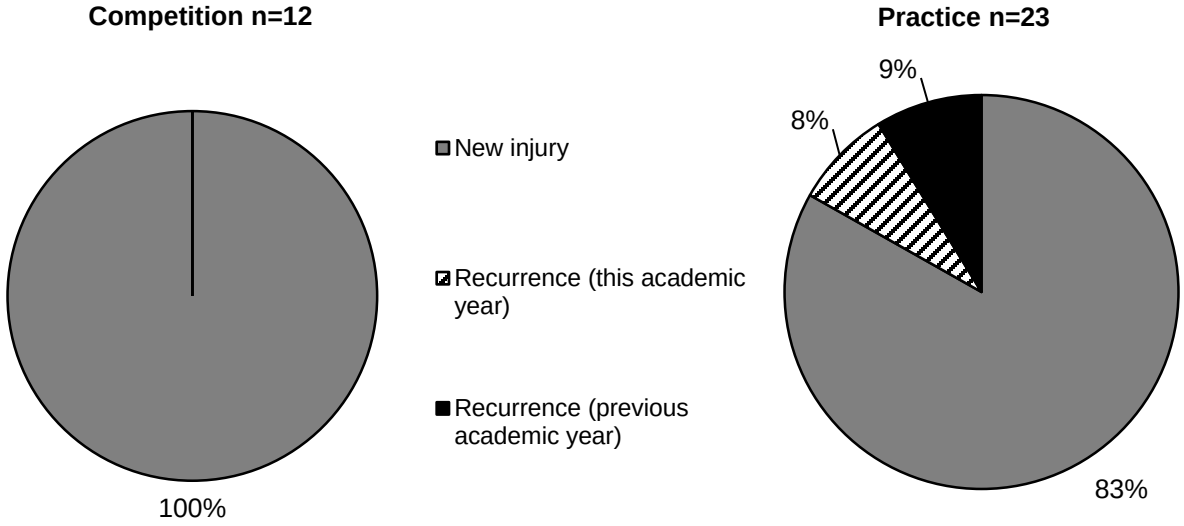


Table 23.6 Time during Season of Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	8	23.5%
Regular season	26	76.5%
Post season	0	0.0%
Total	**34**	**100%**

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

Table 23.7 Practice-Related Variables for Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	8	40.0%
Second 1/2 hour	3	15.0%
1-2 hours into practice	9	45.0%
>2 hours into practice	0	0.0%
Total	**20**	**100%**

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

Table 23.8 Activities Leading to Girls' Tennis Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Overall	
	n	%	n	%	n	%
Activity						
Overhead stroke (other than serve)	0	0.0%	1	7.1%	1	4.8%
Warm-up	0	0.0%	1	7.1%	1	4.8%
Forehand ground stroke	1	14.3%	1	7.1%	2	9.5%
Serve	3	42.9%	1	7.1%	4	19.0%
Conditioning	0	0.0%	5	35.7%	5	23.8%
Running to hit ball	3	42.9%	5	35.7%	8	38.1%
Other	0	0.0%	0	0.0%	0	0.0%
Total	**7**	**100%**	**14**	**100%**	**21**	**100%**

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

Table 23.9 Activity Resulting in Girl' Tennis Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis*							
	Strain/Sprain		Contusion		Fracture		Other	
	n	%	n	%	n	%	n	%
Activity								
Running to hit ball	4	22.2%	0	0.0%	2	66.7%	2	22.2%
General play	7	38.9%	0	0.0%	1	33.3%	2	22.2%
Conditioning	2	11.1%	0	0.0%	0	0.0%	3	33.3%
Overhead stroke (other than serve)	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Forehand ground stroke	2	11.1%	0	0.0%	0	0.0%	0	0.0%
Serve	2	11.1%	0	0.0%	0	0.0%	2	22.2%
Warm-up	1	5.6%	0	0.0%	0	0.0%	0	0.0%
Total	**18**	**100%**	**1**	**100%**	**3**	**50.0%**	**9**	**100%**

***no concussions reported**

XXIV. Cheerleading Injury Epidemiology

Table 24.1 Cheerleading Injury Rates by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	# Injuries	# Exposures	Injury rate (per 1,000 athlete-exposures)
Total	**193**	**282,530**	**0.68**
Competition	16	14,895	1.07
Practice	156	212,298	0.73
Performance	21	55,337	0.38

Table 24.2 Demographic Characteristics of Injured Cheerleading Athletes, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year*

Year in School	**n=189**
Freshman	23.3%
Sophomore	28.6%
Junior	25.9%
Senior	22.2%
Total†	**100%**
Age (years)	
Minimum	14
Maximum	18
Mean (St. Dev.)	15.7 (1.1)
BMI	
Minimum	16.7
Maximum	36.2
Mean (St. Dev.)	22.4 (3.7)

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

Figure 24.1 Diagnosis of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

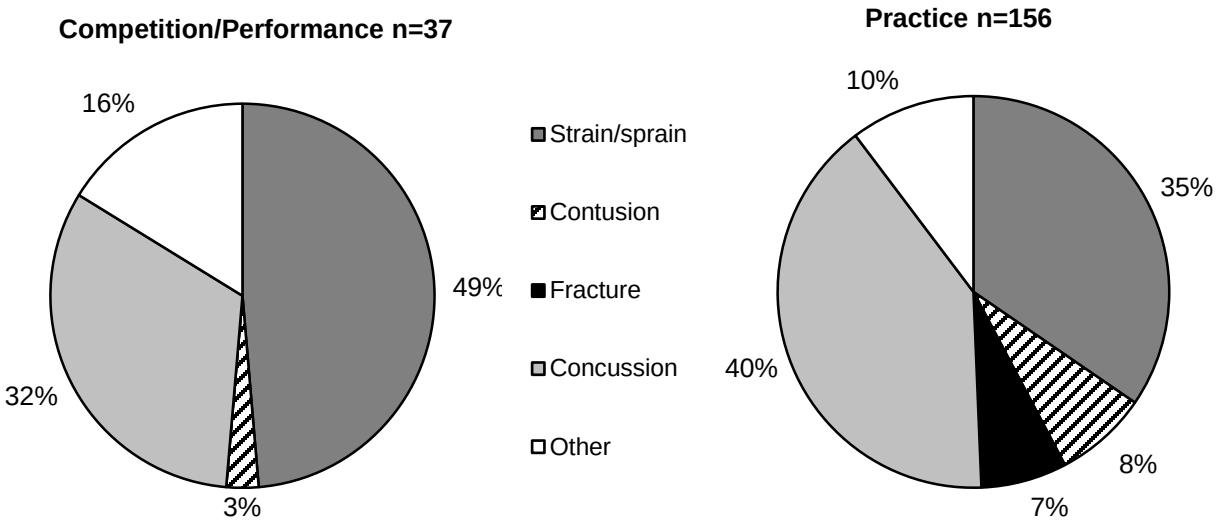


Table 24.3 Body Site of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

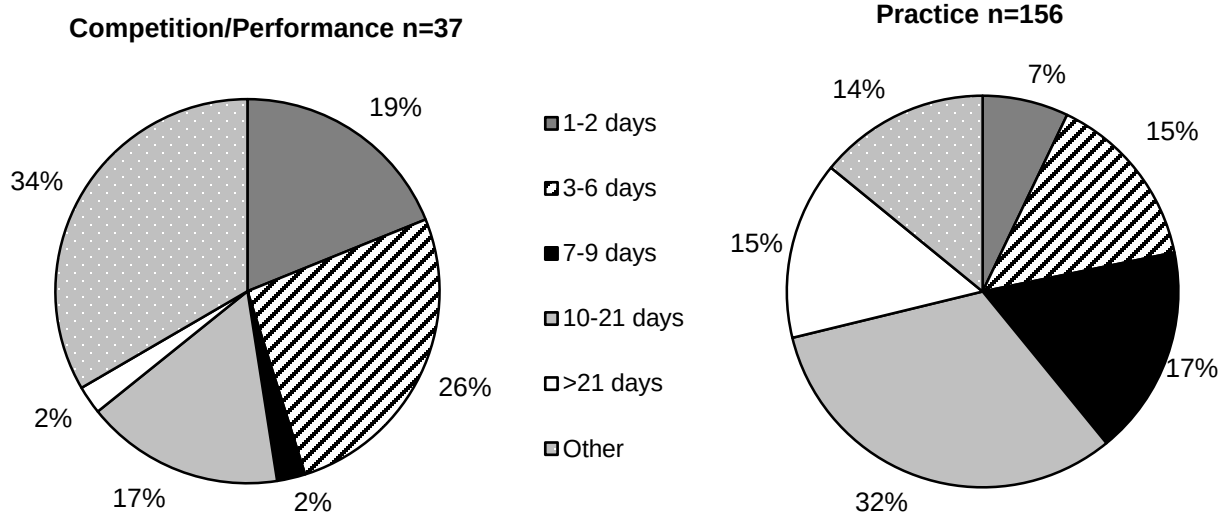
	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Body Site								
Head/face	7	43.8%	65	41.7%	5	23.8%	77	39.9%
Ankle	1	6.3%	17	10.9%	5	23.8%	23	11.9%
Knee	2	12.5%	11	7.1%	3	14.3%	16	8.3%
Trunk	1	6.3%	13	8.3%	0	0.0%	14	7.3%
Shoulder	0	0.0%	12	7.7%	1	4.8%	13	6.7%
Neck	2	12.5%	9	5.8%	0	0.0%	11	5.7%
Hip/thigh/upper leg	0	0.0%	6	3.8%	4	19.0%	10	5.2%
Hand/wrist	0	0.0%	8	5.1%	1	4.8%	9	4.7%
Arm/elbow	2	12.5%	5	3.2%	0	0.0%	7	3.6%
Foot	0	0.0%	6	3.8%	0	0.0%	6	3.1%
Lower leg	0	0.0%	2	1.3%	0	0.0%	2	1.0%
Other	1	6.3%	2	1.3%	2	9.5%	5	2.6%
Total	**16**	**100%**	**156**	**100%**	**21**	**100%**	**193**	**100%**

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

Table 24.4 Ten Most Common Cheerleading Injury Diagnoses by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition n=16		Practice n=156		Performance n=21		Total n=193	
	n	%	n	%	n	%	n	%
Diagnosis								
Head/face concussion	6	37.5%	62	39.7%	5	23.8%	73	37.8%
Ankle strain/sprain	1	6.3%	14	9.0%	5	23.8%	20	10.4%
Knee strain/sprain	2	12.5%	10	6.4%	2	9.5%	14	7.3%
Trunk strain/sprain	1	6.3%	9	5.8%	0	0.0%	10	5.2%
Hip/thigh/upper leg strain/sprain	0	0.0%	5	3.2%	3	14.3%	8	4.1%
Neck strain/sprain	1	6.3%	6	3.8%	0	0.0%	7	3.6%
Shoulder other	0	0.0%	4	2.6%	1	4.8%	5	2.6%
Shoulder strain/sprain	0	0.0%	4	2.6%	0	0.0%	4	2.1%
Hand/wrist fracture	0	0.0%	2	1.3%	2	9.5%	4	2.1%
Foot strain/sprain	0	0.0%	3	1.9%	0	0.0%	3	1.6%

Figure 24.2 Time Loss of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 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 24.5 Cheerleading Injuries Requiring Surgery by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Need for surgery								
Required surgery	0	0.0%	11	7.2%	3	14.3%	14	7.4%
Did not require surgery	16	100.0%	141	92.8%	18	85.7%	175	92.6%
Total	**15**	**100%**	**185**	**100%**	**19**	**100%**	**189**	**100%**

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

Figure 24.3 History of Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

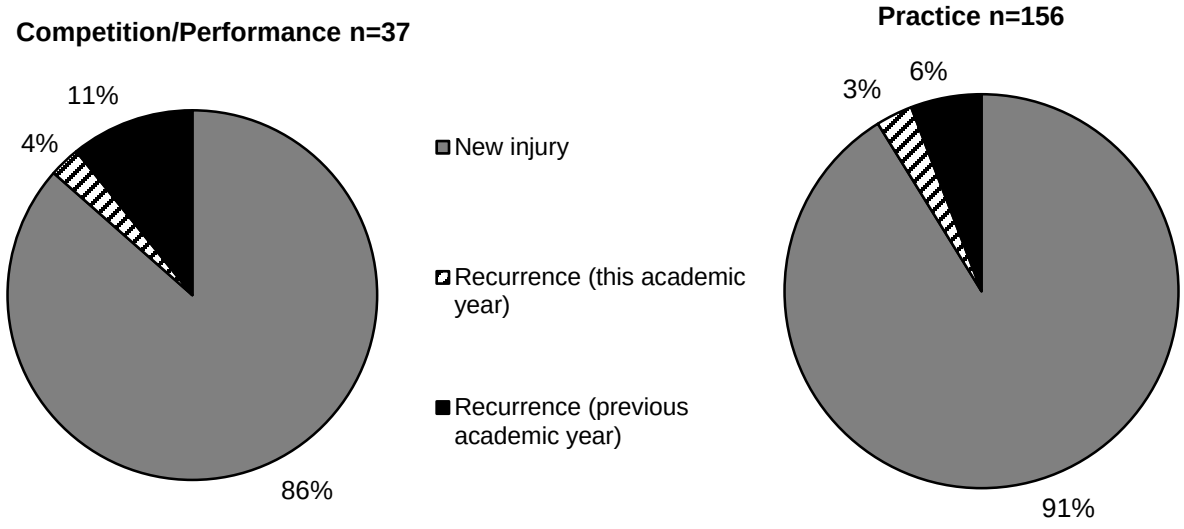


Table 24.6 Time during Season of Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Season		
Preseason	22	11.4%
Regular season	168	87.0%
Post season	3	1.6%
Total	**193**	**100%**

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

Table 24.7 Practice-Related Variables for Cheerleading Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	n	%
Time in Practice		
First 1/2 hour	14	9.5%
Second 1/2 hour	51	34.7%
1-2 hours into practice	77	52.4%
>2 hours into practice	5	3.4%
Total	**147**	**100%**

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

Table 24.8 Activities Leading to Cheerleading Injuries by Type of Exposure, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Competition		Practice		Performance		Overall	
	n	%	n	%	n	%	n	%
Activity								
Stunt	3	20.0%	50	35.0%	1	4.8%	54	30.2%
Tumbling	3	20.0%	21	14.7%	5	23.8%	29	16.2%
Toss	6	40.0%	31	21.7%	4	19.0%	41	22.9%
Pyramid	1	6.7%	27	18.9%	3	14.3%	31	17.3%
Jump	0	0.0%	5	3.5%	2	9.5%	7	3.9%
Warm-up	0	0.0%	1	0.7%	0	0.0%	1	0.6%
Other	2	13.3%	8	5.6%	6	28.6%	16	8.9%
Total	**15**	**100%**	**143**	**100%**	**21**	**100%**	**179**	**100%**

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

Table 24.10 Activity Resulting in Cheerleading Injuries by Injury Diagnosis, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Diagnosis									
	Strain/Sprain		Contusion		Fracture		Concussion		Other	
	n	%	n	%	n	%	n	%	n	%
Activity										
Partner stunt	12	18.2%	5	41.7%	4	40.0%	27	39.1%	6	27.3%
Toss	18	27.3%	1	8.3%	2	20.0%	17	24.6%	3	13.6%
Pyramid	6	9.1%	2	16.7%	2	20.0%	19	27.5%	2	9.1%
Moving tumbling	9	13.6%	2	16.7%	0	0.0%	3	4.3%	3	13.6%
Standing tumbling	6	9.1%	2	16.7%	2	20.0%	1	1.4%	1	4.5%
Other	15	22.7%	0	0.0%	0	0.0%	2	3.1%	7	31.9%
Total	**66**	**100%**	**12**	**100%**	**10**	**100%**	**69**	**100%**	**22**	**100%**

XXIII. Gender Differences within Sports

25.1 Boys' and Girls' Soccer

Table 25.1 Comparison of Boys' and Girls' Soccer Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer*	RR (95% CI)†
Total	1.97	**2.62**	**1.33 (1.19, 1.49)**
Competition	4.05	**6.05**	**1.49 (1.30, 1.72)**
Practice	1.03	**1.12**	1.09 (0.89, 1.33)

*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 25.10 Comparison of Body Sites of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Body Site			
Head/face	23.3%	**32.1%**	**1.38 (1.14, 1.67)**
Hip/thigh/upper leg	**16.5%**	9.6%	**1.72 (1.27, 2.34)**
Ankle	18.9%	**21.5%**	1.14 (0.91, 1.43)
Knee	13.5%	**17.5%**	1.29 (0.98, 1.69**)**
Foot	**5.9%**	5.3%	1.11 (0.70, 1.78)
Lower leg	**7.2%**	3.9%	**1.84 (1.13, 3.00)**
Hand/wrist	**4.6%**	2.8%	1.64 (0.90, 2.97)
Trunk	**4.6%**	2.8%	1.64 (0.90, 2.97)
Shoulder	**2.0%**	1.7%	1.18 (0.52, 2.70)
Arm/elbow	0.9%	**1.1%**	1.19 (0.38, 3.72)
Neck	**1.1%**	0.3%	3.54 (0.72, 17.47)
Other	**1.3%**	1.3%	1.00 (0.38, 2.83)
Total	**100%**	**100%**	--

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

Table 25.11 Comparison of Diagnoses of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Strain/sprain	**46.0%**	43.8%	1.05 (0.93, 1.19)
Concussion	19.9%	**30.6%**	**1.53 (1.25, 1.88)**
Contusion	**13.8%**	7.7%	**1.79 (1.27, 2.52)**
Fracture	**7.6%**	4.7%	**1.62 (1.02, 2.55)**
Other	12.7%	**13.2%**	1.04 (0.68, 1.34)
Total	**100%**	**100%**	---

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

Table 25.12 Most Common Boys' and Girls' Soccer Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Diagnosis			
Head/face concussion	19.7%	**30.5%**	**1.55 (1.26, 1.91)**
Hip/thigh/upper leg strain/sprain	**12.4%**	6.9%	**1.80 (1.25, 2.59)**
Ankle strain/sprain	17.8%	**20.4%**	1.15 (0.90, 1.45)
Knee strain/sprain	6.1%	**9.1%**	1.49 (0.99, 2,25)
Knee other	5.0%	**6.0%**	1.19 (0.74, 1.92)

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

Table 25.13 Comparison of Time Loss of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Time Loss			
1-2 days	**15.0%**	11.1%	1.35 (1.00, 1.82)
3-6 days	**28.9%**	20.6%	**1.41 (1.15, 1.72)**
7-9 days	**14.8%**	14.3%	1.04 (0.79, 1.37)
10-21 days	20.0%	**27.8%**	1.39 (1.12, 1.71)
22 days or more	4.6%	**6.3%**	1.35 (0.83, 2.20)
Other	16.5%	**19.9%**	1.21 (0.95, 1.01)
Total	**100%**	**100%**	---

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

Table 25.14 Comparison of Mechanisms of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Mechanism			
Contact with another player	**28.2%**	27.5%	1.03 (0.85, 1.24)
N/A (overuse, heat illness, conditioning, etc.)	**15.8%**	12.0%	1.32 (0.98, 1.78)
Stepped on/fell on/kicked	**13.2%**	10.1%	1.31 (0.94, 1.81)
Contact with ball	13.6%	**21.4%**	**1.57 (1.20, 2.05)**
Rotation around planted foot/inversion	10.7%	**15.0%**	**1.41 (1.03, 1.94)**
Slide tackle	**5.3%**	3.4%	1.56 (0.89, 2.74)
Uneven playing surface	2.2%	**3.6%**	1.67 (0.81, 3.40)
Contact with goal	0.2%	**0.7%**	3.47 (0.39, 30.92)
Other	**10.8%**	6.3%	**1.72 (1.15, 2.56)**
Total	**100%**	**100%**	--

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

Table 25.15 Comparison of Activities of Boys' and Girls' Soccer Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' soccer	Girls' soccer	IPR (95% CI)
Soccer Activity			
General play	**27.8%**	22.0%	**1.26 (1.03, 1.56)**
Defending	11.5%	**12.7%**	1.11 (0.80, 1.53)
Heading ball	11.7%	11.7%	1.00 (0.71, 1.39)
Chasing loose ball	7.9%	**10.1%**	1.28 (0.87, 1.87)
Ball handling/dribbling	7.9%	**8.2%**	1.03 (0.69, 1.55)
Goaltending	7.5%	**7.3%**	1.03 (0.67, 1.57)
Shooting (foot)	**6.4%**	5.5%	1.21 (0.75, 1.95)
Passing (foot)	6.4%	**7.3%**	1.09 (0.72, 1.70)
Conditioning	3.0%	**2.2%**	1.36 (0.64, 2.88)
Receiving pass	5.6%	**6.5%**	1.16 (0.72, 1.87)
Blocking shot	1.2%	**2.8%**	2.34 (0.93, 5.95)
Attempting slide tackle	**1.0%**	1.0%	1.06 (0.32, 3.44)
Receiving slide tackle	0.9%	**1.2%**	1.36 (0.42, 4.44)
Other	1.2%	**1.4%**	1.14 (0.40, 3.22)
Total	**100%**	**100%**	---

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

25.2 Boys' and Girls' Basketball

Table 25.2 Comparison of Boys' and Girls' Basketball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	RR (95% CI)
Total	1.60	**2.21**	**1.38 (1.23, 1.56)**
Competition	2.86	**4.29**	**1.50 (1.28, 1.75)**
Practice	1.05	**1.29**	**1.23 (1.03, 1.47)**

Table 25.20 Comparison of Body Sites of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Body Site			
Ankle	**32.8%**	26.1%	**1.26 (1.05, 1.51)**
Head/face	19.2%	**27.5%**	**1.43 (1.15, 1.78)**
Knee	13.0%	**17.9%**	**1.38 (1.04, 1.83)**
Hand/wrist	9.2%	**7.8%**	1.17 (0.80, 1.73)
Hip/thigh/upper leg	**7.3%**	5.5%	1.33 (0.85, 2.10)
Trunk	**4.0%**	2.8%	1.42 (0.75, 2.67)
Lower leg	2.2%	**3.2%**	1.45 (0.71, 2.99)
Foot	**6.2%**	3.9%	1.59 (0.94, 2.69)
Shoulder	2.2%	**2.5%**	1.13 (0.53, 2.42)
Arm/elbow	**2.6%**	0.9%	**2.89 (1.05, 7.96)**
Neck	0.0%	**0.2%**	---
Other	**1.3%**	1.6%	1.25 (0.47, 3.33)
Total	**100%**	**100%**	---

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

Table 25.21 Comparison of Diagnoses of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Strain/sprain	**50.9%**	48.0%	1.06 (0.94, 1.20)
Concussion	14.3%	**24.5%**	**1.72 (1.33, 2.21)**
Fracture	**9.5%**	6.0%	**1.58 (1.04, 2.39)**
Contusion	**8.6%**	5.5%	**1.56 (1.01, 2.42)**
Other	**16.7%**	16.0%	1.04 (0.80, 1.36)
Total	**100%**	**100%**	---

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

Table 25.22 Most Common Boys' and Girls' Basketball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Diagnosis			
Ankle strain/sprain	**31.5%**	25.4%	**1.24 (1.03, 1.50)**
Head/face concussion	14.3%	**24.5%**	**1.72 (1.33, 2.21)**
Knee strain/sprain	4.9%	**9.2%**	1.87 (1.19, 2.93)
Knee other	5.3%	**7.1%**	1.34 (0.84, 2.13)

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

Table 25.23 Comparison of Time Loss of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Time Loss			
1-2 days	**20.3%**	19.9%	1.02 (0.81, 1.29)
3-6 days	**24.9%**	17.1%	**1.46 (1.16, 1.85)**
7-9 days	16.8%	**17.6%**	1.05 (0.77, 1.32)
10-21 days	20.0%	**20.8%**	1.04 (0.83, 1.31)
22 days or more	7.0%	**7.6%**	1.10 (0.72, 1.67)
Other	11.0%	**17.1%**	**1.55 (1.15, 2.10)**
Total	**100%**	**100%**	---

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

Table 25.24 Comparison of Mechanisms of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Mechanism			
Collision with another player	28.8%	**32.4%**	1.12 (0.94, 1.35)
Jumping/landing	**27.1%**	15.9%	**1.70 (1.33, 2.17)**
Stepped on/fell on/kicked	9.4%	**10.1%**	1.08 (0.74, 1.57)
Rotation around a planted foot/inversion	11.7%	**12.6%**	1.08 (0.78, 1.45)
N/A (e.g., overuse, heat illness, etc.)	7.8%	**12.4%**	**1.59 (1.10, 2.32)**
Contact with ball	2.3%	**5.6%**	**2.41 (1.24, 4.67)**
Other	**12.9%**	10.9%	1.18 (0.85, 1.65)
Total	**100%**	**100%**	---

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

Table 25.35 Comparison of Activities of Boys' and Girls' Basketball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' basketball	Girls' basketball	IPR (95% CI)
Basketball Activity			
Rebounding	**26.6%**	17.5%	**1.52 (1.20, 1.93)**
General play	21.3%	**28.7%**	**1.35 (1.09, 1.67)**
Defending	14.5%	**14.6%**	1.01 (0.75, 1.36)
Shooting	**12.7%**	6.8%	**1.87 (1.26, 2.76)**
Chasing loose ball	9.5%	**11.9%**	**1.25 (0.87, 1.78)**
Ball handling/dribbling	4.8%	**7.0%**	1.47 (0.89, 2.43)
Receiving pass	3.4%	**5.3%**	1.56 (0.86, 2.82)
Conditioning	2.6%	**3.7%**	1.43 (0.72, 2.87)
Other	**4.6%**	4.5%	1.02 (0.58, 1.79)
Total	**100%**	**100%**	---

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

25.3 Boys' Baseball and Girls' Softball

Table 25.3 Comparison of Baseball and Softball Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	RR (95% CI)
Total	0.85	**1.29**	**1.52 (1.66, 2.38)**
Competition	1.45	**2.20**	**1.52 (1.20, 1.92)**
Practice	0.53	**0.80**	**1.51 (1.14, 2.01)**

Table 25.30 Comparison of Body Sites of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Body Site			
Head/face	17.6%	**22.0%**	1.25 (0.86, 1.80)
Arm/elbow	**17.6%**	6.4%	**2.76 (1.59, 4.79)**
Hand/wrist	**14.5%**	10.4%	1.39 (0.86, 2.26)
Shoulder	**15.8%**	12.0%	1.32 (0.84, 2.08)
Hip/thigh/upper leg	9.5%	**9.6%**	1.01 (0.58, 1.76)
Ankle	10.0%	**15.6%**	1.57 (0.96, 2.60)
Trunk	4.5%	**6.0%**	1.33 (0.61, 2.89)
Knee	4.5%	**8.0%**	1.77 (0.85, 3.70)
Lower leg	2.7%	5.3%	1.96 (0.81, 5.28)
Foot	1.8%	**2.0%**	1.10 (0.30, 4.06)
Neck	0.5%	**0.8%**	1.60 (0.16, 19.37)
Other	0.9%	**1.6%**	1.77 (0.33, 9.56)
Total	**100%**	**100%**	---

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

Table 25.31 Comparison of Diagnoses of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Strain/sprain	**37.6%**	37.5%	1.00 (0.79, 1.27)
Contusion	8.1%	**17.5%**	**2.15 (1.28, 3.61)**
Concussion	10.9%	**15.9%**	1.47 (0.92, 2.35)
Fracture	**13.6%**	8.8%	1.55 (0.92, 2.60)
Other	**29.9%**	20.3%	1.47 (1.07, 2.02)
Total	**100%**	**100%**	---

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

Table 25.32 Most Common Baseball and Softball Injury Diagnoses*, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Diagnosis			
Head/face concussion	10.9%	**15.1%**	1.39 (0.86, 2.25)
Hip/thigh/upper leg strain/sprain	7.7%	**8.0%**	1.04 (0.56, 1.93)
Ankle strain/sprain	6.8%	**14.3%**	**2.13 (1.19, 3.75)**
Shoulder other	**10.0%**	6.0%	1.67 (0.87, 3.13)
Hand/wrist fracture	**6.3%**	5.2%	1.22 (0.94, 1.03)

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

Table 25.33 Comparison of Time Loss of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Time Loss			
1-2 days	**18.3%**	12.2%	1.50 (0.97, 2.33)
3-6 days	**22.2%**	20.3%	1.09 (0.77, 1.55)
7-9 days	15.4%	**17.9%**	1.17 (0.78, 1.75)
10-21 days	**19.9%**	18.3%	1.09 (0.75, 1.58)
22 days or more	7.7%	**8.4%**	1.09 (0.59, 2.01)
Other	16.6%	**22.7%**	1.37 (0.94, 1.95)
Total	**100%**	**100%**	---

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

Table 25.34 Comparison of Mechanisms of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Mechanism			
Contact with another player	11.1%	**13.1%**	1.16 (0.70, 1.91)
Throwing - pitching	**13.2%**	5.1%	**2.60 (1.36, 4.98)**
N/A (overuse, heat illness, conditioning, etc.)	**14.2%**	10.6%	1.34 (0.81, 2.20)
Hit by batted ball	7.1%	**10.2%**	1.44 (0.78, 2.67)
Hit by pitch	4.7%	**7.2%**	1.53 (0.72, 3.26)
Contact with bases	11.3%	**14.4%**	1.27 (0.78, 2.07)
Contact with thrown ball (non-pitch)	3.8%	**11.4%**	**3.03 (1.41, 6.53)**
Throwing - not pitching	9.5%	**11.5%**	1.21 (0.70, 2.10)
Rotation around a planted foot/inversion	5.7%	**7.2%**	1.27 (0.62, 2.60)
Other	**19.4%**	9.3%	**2.09 (1.10, 2.89)**
Total	**100%**	**100%**	---

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

Table 25.35 Comparison of Activities of Baseball and Softball Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Baseball	Softball	IPR (95% CI)
Baseball/Softball Activity			
Pitching	**19.4%**	11.5%	**1.69 (1.08, 2.65)**
Fielding a batted ball	**19.0%**	18.3%	1.04 (0.70, 1.53)
Running bases	13.7%	**19.6%**	1.42 (0.93, 2.18)
Batting	**13.3%**	7.7%	1.72 (0.99, 3.04)
Throwing (not pitching)	9.5%	**11.5%**	1.21 (0.70, 2.10)
Fielding a thrown ball	2.8%	**5.1%**	1.80 (0.69, 4.70)
General play	**6.2%**	4.7%	1.32 (0.60, 2.88)
Sliding	8.5%	**8.5%**	1.01 (0.51, 1.94)
Catching	2.4%	**8.5%**	3.59 (1.37, 9.40)
Conditioning	1.4%	**2.1%**	1.50 (0.36, 6.19)
Other	**3.8%**	2.6%	1.49 (0.52, 4.21)
Total	**100%**	**100%**	---

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

25.4 Boys' and Girls' Swimming

Table 25.4 Comparison of Boys' and Girls' Swimming Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	RR (95% CI)
Total	0.19	**0.22**	1.14 (0.60, 2.16)
Competition	0.19	**0.22**	1.14 (0.26, 5.11)
Practice	0.19	**0.21**	1.14 (0.46, 2.82)

Table 25.40 Comparison of Body Sites of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Body Site			
Shoulder	**29.4%**	28.6%	1.03 (0.38, 2.80)
Head/face	11.8%	**42.9%**	3.64 (0.91, 14.67)
Knee	**17.6%**	4.8%	3.71 (0.42, 32.49)
Hip/Thigh/upper leg	**5.9%**	4.8%	1.24 (0.08, 18.33)
Trunk	**23.5%**	4.8%	4.94 (0.61, 40.19)
Lower leg	**---**	**---**	---
Foot	5.9%	**9.5%**	1.62 (0.16, 16.37)
Ankle	---	**---**	---
Arm/elbow	5.9%	**---**	---
Hand/wrist	**---**	**---**	---
Neck	**---**	4.8%	
Other	---	**---**	---
Total	**100%**	**100%**	**---**

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

Table 25.41 Comparison of Diagnoses of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Strain/sprain	**29.4%**	19.0%	1.54 (0.49, 4.87)
Concussion	5.9%	**33.3%**	5.67 (0.77, 41.68)
Fracture	5.9%	**---**	---
Contusion	---	**---**	---
Other	58.8%	**47.6%**	1.24 (0.68, 2.25)
Total	**100%**	**100%**	---

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

Table 25.42 Most Common Boys' and Girls' Swimming Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Diagnosis			
Shoulder other	**29.4%**	28.6%	1.03 (0.38, 2.80)
Head/face concussion	5.9%	**33.3%**	5.67 (0.77, 41.68)
Trunk other	**5.9%**	---	**---**
Trunk strain/sprain	**17.6%**	4.8%	3.71 (0.42, 32.49)
Shoulder strain/sprain	**---**	---	---

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

Table 25.43 Comparison of Time Loss of Boys' and Girls' Swimming Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Time Loss			
1-2 days	**29.4%**	14.3%	2.06 (0.57, 7.41)
3-6 days	**35.3%**	19.0%	1.85 (0.62, 5.52)
7-9 days	17.6%	**23.8%**	1.35 (0.38, 4.86)
10-21 days	17.6%	**28.6%**	1.62 (0.46, 5.54)
22 days or more	**---**	---	---
Other	**---**	14.3%	---
Total	**100%**	**100%**	---

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

Table 25.44 Comparison of Mechanisms of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Mechanism			
N/A (overuse, heat illness, conditioning, etc.)	**61.5%**	55.0%	1.12 (0.62, 2.01)
Contact with wall	7.7%	20.0%	2.60 (0.32, 20.75)
Contact with another person	---	**---**	---
Other	**30.8%**	25.0%	1.21 (0.40, 3.75)
Total	**100%**	**100%**	**---**

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

Table 25.45 Comparison of Activities of Boys' and Girls' Swimming and Diving Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' swimming	Girls' swimming	IPR (95% CI)
Swimming Activity			
Swimming	**72.7%**	72.2%	1.01 (0.34, 1.60)
Flip turn off wall	**18.2%**	5.6%	3.27 (0.34, 32.00)
Diving off board/platform/starting platform	---	**16.7%**	---
Other	9.1%	**5.6%**	1.64 (0.11, 23.59)
Total	**100%**	**100%**	

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

25.5 Boys' and Girls' Track and Field

Table 25.5 Comparison of Boys' and Girls' Track and Field Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	RR (95% CI)
Total	0.70	**0.92**	**1.32 (1.08, 1.59)**
Competition	**1.36**	1.23	1.11 (0.78, 1.56)
Practice	0.55	**0.85**	**1.55 (1.22, 1.95)**

Table 25.50 Comparison of Body Sites of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Body Site			
Hip/thigh/upper leg	**38.9%**	37.1%	1.05 (0.82, 1.34)
Lower leg	18.2%	**18.8%**	1.03 (0.69, 1.55)
Ankle	9.1%	**11.3%**	1.24 (0.69, 2.21)
Knee	8.6%	**14.1%**	1.60 (0.94, 2.88)
Trunk	**5.1%**	4.2%	1.20 (0.50, 2.88)
Foot	4.5%	**6.6%**	1.45 (0.64, 3.27)
Shoulder	**3.0%**	1.9%	1.61 (0.46, 5.63)
Head/face	**7.1%**	1.9%	**3.77 (1.26, 11.25)**
Arm/elbow	**2.5%**	1.4%	1.79 (0.43, 7.40)
Hand/wrist	**1.5%**	1.4%	1.08 (0.22, 5.27)
Neck	**---**	---	**---**
Other	**1.5%**	1.4%	1.08 (0.22, 5.27)
Total	**100%**	**100%**	---

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

Table 25.51 Comparison of Diagnoses of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Strain/sprain	**53.5%**	58.1%	1.09 (0.91, 1.29)
Contusion	0.5%	**1.9%**	3.68 (0.42, 32.68)
Fracture	**5.1%**	4.2%	1.21 (0.50, 2.91)
Concussion	**5.1%**	1.9%	2.72 (0.87, 8.52)
Other	**35.9%**	**34.0%**	1.06 (0.81, 1.38)
Total	**100%**	**100%**	---

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

Table 25.52 Most Common Boys' and Girls' Track and Field Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Diagnosis			
Hip/thigh/upper leg strain/sprain	32.3%	**32.6%**	1.01 (0.76, 1.33)
Lower leg other	13.1%	**14.0%**	**1.06 (0.65, 1.73)**
Hip/thigh/upper leg other	**5.6%**	4.2%	1.33 (0.56, 3.14)
Ankle strain/sprain	7.6%	**10.7%**	1.41 (0.76, 2.63)
Lower leg strain/sprain	4.0%	**4.2%**	1.04 (0.41, 2.63)
Knee other	6.6%	**9.8%**	1.49 (0.77, 2.89)

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

Table 25.53 Comparison of Time Loss of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Time Loss			
1-2 days	**19.2%**	17.7%	1.09 (0.72, 1.63)
3-6 days	27.3%	**27.9%**	1.02 (0.75, 1.40)
7-9 days	11.1%	**11.2%**	1.03 (0.54, 1.84)
10-21 days	13.1%	**17.7%**	1.35 (0.85, 2.13)
22 days or more	7.6%	**7.9%**	1.04 (0.54, 2.03)
Other	**21.7%**	17.7%	1.23 (0.83, 1.82)
Total	**100%**	**100%**	---

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

Table 25.54 Comparison of Mechanisms of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Mechanism			
N/A (e.g., overuse, heat illness, conditioning, etc.)	**61.5%**	55.0%	1.12 (0.94, 1.33)
Contact with ground/track/surface	10.1%	**10.9%**	1.08 (0.60, 1.95)
Fall/trip	6.1%	**6.4%**	1.05 (0.48, 2.28)
Rotation around planted foot/inversion	6.1%	**11.9%**	1.93 (0.98, 3.83)
Contact with field equipment	6.7%	**6.9%**	1.03 (0.49, 2.18)
Uneven playing surface	0.6%	2.0%	3.55 (0.40, 31.42)
Stepped on/kicked	0.6%	---	---
Contact with another person	0.6%	---	---
Other	**7.8%**	6.9%	1.13 (0.55, 2.30)
Total	**100%**	**100%**	---

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

Table 25.55 Comparison of Activities of Boys' and Girls' Track and Field Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' track	Girls' track	IPR (95% CI)
Track Activity			
Running	63.2%	**64.5%**	1.02 (0.89, 1.18)
Jumping/landing	9.9%	13.3%	1.35 (0.77, 2.36)
Conditioning	**6.6%**	3.9%	1.67 (0.70, 4.00)
Throwing	**4.9%**	4.9%	1.01 (0.41, 2.38)
Running hurdles	**9.9%**	5.9%	1.67 (0.83, 3.38)
Warming up	1.1%	**3.9%**	3.59 (0.77, 16.67)
Leaving block	1.1%	**1.5%**	1.35 (0.23, 7.96)
Hit by shot put/discus/javelin/hammer	---	**---**	---
Other	**3.3%**	2.0%	1.67 (0.48, 5.84)
Total	**100%**	**100%**	---

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

25.6 Boys' and Girls' Cross Country

Table 25.6 Comparison of Boys' and Girls' Cross Country Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	RR (95% CI)
Total	0.62	**1.15**	**1.86 (1.42, 2.44)**
Competition	0.70	**1.57**	**2.23 (1.23, 4.18)**
Practice	0.60	**1.06**	**1.77 (1.31, 2.40)**

Table 25.60 Comparison of Body Sites of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Body Site			
Lower leg	**27.1%**	21.0%	1.29 (0.80, 2.07)
Hip/thigh/upper leg	**25.9%**	22.5%	1.15 (0.72, 1.85)
Knee	**23.5%**	16.7%	1.41 (0.83, 2.41)
Ankle	8.2%	**13.8%**	1.67 (0.73, 3.81)
Foot	9.4%	**13.8%**	1.46 (0.67, 3.19)
Trunk	3.5%	**4.3%**	1.23 (0.32, 4.80)
Arm/elbow	---	**---**	---
Head/face	**---**	2.9%	---
Hand/wrist	---	**---**	---
Shoulder	---	**---**	---
Neck	---	**---**	---
Other	2.4%	**5.1%**	2.16 (0.46, 10.14)
Total	**100%**	**100%**	---

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

Table 25.61 Comparison of Diagnoses of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Diagnosis			
Strain/sprain	**45.3%**	34.8%	1.30 (0.94, 1.81)
Contusion	**2.3%**	0.7%	3.27 (0.30, 34.86)
Fracture	---	1.4%	---
Concussion	**---**	2.2%	---
Other	52.3%	**60.9%**	1.16 (0.91, 1.48)
Total	**100%**	**100%**	---

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

Table 25.62 Most Common Boys' and Girls' Cross Country Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Diagnosis			
Lower leg other	16.3%	**16.7%**	1.02 (0.56, 1.88)
Hip/thigh/upper leg strain sprain	**17.4%**	12.3%	1.42 (0.75, 2.69)
Lower leg strain/sprain	**10.5%**	4.3%	2.41 (0.89, 6.53)
Hip/thigh/upper leg other	7.0%	**9.4%**	1.35 (0.53, 3.42)
Ankle strain/sprain	7.0%	**10.1%**	1.45 (0.58, 3.64)
Knee other	**19.8%**	**13.0%**	1.52 (0.83, 2.78)

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

Table 25.63 Comparison of Time Loss of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Time Loss			
1-2 days	**25.6%**	24.6%	1.05 (0.64, 2.44)
3-6 days	**38.4%**	22.5%	**1.71 (1.13, 2.57)**
7-9 days	12.8%	**15.9%**	1.24 (0.59, 2.18)
10-21 days	15.1%	**17.4%**	1.15 (0.62, 2.14)
22 days or more	**4.7%**	2.2%	2.14 (0.49, 9.33)
Other	3.5%	**17.4%**	**4.99 (1.55, 16.06)**
Total	**100%**	**100%**	---

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

Table 25.64 Comparison of Mechanisms of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Mechanism			
Overuse	**67.9%**	66.4%	1.02 (0.84, 1.24)
Uneven surface	**12.3%**	6.1%	2.02 (0.83, 4.91)
N/A (e.g., heat illness, conditioning, etc.)	4.9%	**8.4%**	1.70 (0.56, 5.16)
Contact with ground/track/surface	**6.2%**	3.8%	1.62 (0.48, 5.41)
Fall/trip	2.5%	**6.1%**	2.47 (0.54, 11.36)
Rotation around planted foot/inversion	2.5%	**6.1%**	2.47 (0.54, 11.36)
Contact with obstacle	**2.5%**	0.8%	3.24 (0.29, 35.10)
Contact with another person	**---**	0.8%	---
Other	1.2%	**1.5%**	1.24 (0.11, 13.42)
Total	**100%**	**100%**	---

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

Table 25.65 Comparison of Activities of Boys' and Girls' Cross Country Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' cross country	Girls' cross country	IPR (95% CI)
Activity			
Running	**91.0%**	88.5%	1.03 (0.94, 1.13)
Conditioning	**7.7%**	6.9%	1.11 (0.41, 3.03)
Warming up	--	2.3%	---
Cooldown	---	2.3%	---
Other	1.3%	**---**	---
Total	**100%**	**100%**	---

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

25.7 Boys' and Girls' Tennis

Table 25.7 Comparison of Boys' and Girls' Tennis Injury Rates, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	RR (95% CI)
Total	0.21	**0.55**	**2.65 (1.40, 5.30)**
Competition	0.46	**0.62**	1.34 (0.55, 3.79)
Practice	0.10	**0.52**	**5.26 (1.95, 17.78)**

Table 25.70 Comparison of Body Sites of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Body Site			
Lower leg	8.3%	**14.3%**	1.71 (0.22, 13.24)
Hip/thigh/upper leg	---	5.7%	---
Knee	**16.7%**	11.4%	1.46 (0.31, 6.98)
Ankle	**33.3%**	25.7%	1.30 (0.49, 3.45)
Foot	**8.3%**	2.9%	2.92 (0.20, 43.10)
Trunk	8.3%	**8.6%**	1.03 (0.12, 8.97)
Head/face	---	2.9%	---
Arm/elbow	**8.3%**	2.9%	2.92 (0.20, 43.10)
Hand/wrist	16.7%	**17.1%**	1.03 (0.24, 4.43)
Shoulder	**---**	8.6%	---
Neck	---	---	---
Other	**---**	---	---
Total	**100%**	**100%**	---

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

Table 25.71 Comparison of Diagnoses of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Diagnosis			
Strain/sprain	**75.0%**	54.3%	1.38 (0.88, 2.16)
Contusion	**16.7%**	5.7%	2.92 (0.46, 18.50)
Fracture	---	8.6%	---
Concussion	**---**	**---**	---
Other	8.3%	**31.4%**	3.77 (0.54, 26.23)
Total	**100%**	**100%**	---

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

Table 25.72 Most Common Boys' and Girls' Tennis Injury Diagnoses, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Diagnosis			
Knee strain/sprain	**16.7%**	2.9%	5.83 (0.58, 58.72)
Ankle strain/sprain	**33.3%**	25.7%	1.30 (0.49, 3.45)
Knee other	---	**8.6%**	---
Lower leg strain/sprain	---	**5.7%**	---

*Only includes diagnoses accounting for >5% of tennis injuries.

Table 25.73 Comparison of Time Loss of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Time Loss			
1-2 days	25.0%	**31.4%**	1.26 (0.42, 3.76)
3-6 days	**33.3%**	25.7%	1.30 (0.49, 3.45)
7-9 days	**16.7%**	11.4%	1.46 (0.31, 6.98)
10-21 days	**8.3%**	2.9%	2.92 (0.20, 43.10)
22 days or more	**8.3%**	5.7%	1.46 (0.15, 14.68)
Other	8.3%	**22.9%**	2.74 (0.38, 19.72)
Total	**100%**	**100%**	---

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

Table 25.74 Comparison of Mechanisms of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Tennis Mechanism			
Rotation around a planted foot	**54.5%**	35.5%	1.54 (0.75, 3.15)
Non-contact	18.2%	**35.5%**	1.95 (0.51, 7.46)
Contact with racquet	---	9.7%	---
Contact with surface	9.1%	---	---
Contact with net	9.1%	---	---
Stepped on ball	---	3.2%	---
Contact with out of bounds object	---	3.2%	---
Other	9.1%	12.9%	---
Total	**100%**	**100%**	---

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

Table 25.75 Comparison of Activities of Boys' and Girls' Tennis Injuries, High School Sports-Related Injury Surveillance Study, US, 2015-16 School Year

	Boys' tennis	Girls' tennis	IPR (95% CI)
Tennis Activity			
General Play	9.1%	**32.3%**	3.55 (0.51, 24.62)
Chasing/running to hit ball	**54.5%**	25.8%	2.11 (0.95, 4.73)
Conditioning	---	16.1%	---
Forehand ground stroke	**9.1%**	6.5%	1.41 (0.14, 14.05)
One-handed backhand ground stroke	9.1%	**---**	---
Serve	9.1%	**12.9%**	1.41 (0.51, 4.56)
Two-handed backhand	9.1%	**---**	---
Overhead	---	3.2%	---
Warm up	---	3.2%	---
Total	**100%**	**100%**	---

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

XXVII. Reporter Demographics & Compliance

During the 2015-16 school year, 236 ATs initially enrolled to participate in the study at the beginning of the school year. ATs were expected to report for every week in which they were enrolled. For example, an AT who joined the study as a replacement school in week 10 was not expected to report for weeks 1-9. Overall, 203 enrolled ATs reported an average of 39 study weeks. The majority of ATs (85.7%) reported all the weeks during which they were enrolled, with only 7.4% of ATs missing over 10 weeks. Because internal validity checks conducted during the first six years of the study consistently found high sensitivity, specificity, positive predictive values, and negative predictive values, internal validity checks will be conducted every other year. Internal validity checks during the 2014-15 academic year yielded 90.9% sensitivity, 98.4% specificity, a positive predictive value of 95.2%, and a negative predictive value of 96.9%.

Prior to the start of the 2015-16 High School RIO™ study, participating ATs were asked to complete a short demographics survey. Over 80% (83.8%) of participating high schools were public schools, with the remainder being private. All ATs except for four provided services to athletes of their high school on 5 or more days each week. Over half (73.7%) of ATs participating during the 2015-16 study year had previously participated in the High School RIO™ study.

An online "End of Season" survey gave all participating ATs (both in the original study as well as in the expanded study including those ATs who did not report any data) the opportunity to provide feedback on their experiences with High School RIO™. This survey was completed by 132 ATs (65.0%). Average reporting time burdens were 23 minutes for the weekly

exposure report and 9 minutes for the injury report form. Using a 5 point Likert scale, RIO™ was overwhelmingly reported to be either very easy (56.8%) or somewhat easy (37.9%) to use (5 and 4 on the Likert scale, respectively), with ATs being either very satisfied (62.1%) or somewhat satisfied (26.5%) with the study (5 and 4 on the Likert scale, respectively). Suggestions provided by ATs, such as the addition or clarification of questions or answer choices, will be used to improve the National High School Sports-Related Injury Surveillance Study for the 2016-17 school year.

XXV. Summary

High school sports play an important role in the adoption and maintenance of a physically active lifestyle among millions of US adolescents. Too often injury prevention in this population is overlooked as sports-related injuries are thought to be unavoidable. In reality, sports-related injuries are largely preventable through the application of evidence-based preventive interventions. Such preventive interventions can include educational campaigns, introduction of new/improved protective equipment, rule changes, other policy changes, etc. The morbidity, mortality, and disability caused by high school sports-related injuries can be reduced through the development and implementation of improved injury diagnosis and treatment modalities as well as through effective prevention strategies. However, surveillance of exposure based injury rates in a large nationally disperse sample of high school athletes and subsequent epidemiologic analysis of patterns of injury are needed to drive evidence-based prevention practices.

Prior to the implementation of the High School Sports-Related Injury Surveillance Study by Dr. Comstock, the study of high school sports-related injuries had largely been limited by an inability to calculate injury rates due to a lack of exposure data (i.e., frequency of participation in athletic activities including training, practice, and competition), an inability to compare findings across groups (i.e., sports/activities, genders, schools, and levels of competition), or an inability to generalize findings from small non-representative samples. The value of national injury surveillance studies that collect injury, exposure, and risk factor data from representative samples has been well demonstrated by the National Collegiate Athletic Association's Injury Surveillance System (NCAA ISS). Data collected by the NCAA ISS since 1982 has been used to develop preventive interventions including changes in coaching habits, increased use of protective equipment, and rule changes which have had proven success in reducing injuries among collegiate athletes. For example, NCAA ISS data has been used to develop several interventions

intended to reduce the number of preseason heat-related football injuries including the elimination of consecutive days of multiple practices, daily hour limitations, and a gradual increase in equipment for conditioning and heat acclimation. Additionally, several committees have considered NCAA ISS data when making recommendations including the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports' recommendation for mandatory eye protection in women's lacrosse, the NCAA Men's Ice Hockey Rules Committee's recommendation for stricter penalties for hitting from behind, checking into the boards, and not wearing a mouthpiece, and the NCAA Men's Basketball Rules Committee's recent discussions of widening the free-throw lane to prevent injuries related to player contact. Unfortunately, because an equivalent injury surveillance system to collect injury and exposure data from a nationally representative sample of high school athletes had not previously existed, injury prevention efforts targeted to reduce injury rates in this population were based largely upon data collected from collegiate athletes. This is unacceptable because distinct biophysiological differences (e.g., lower muscle mass, immature growth plates, etc.) means high school athletes are not merely miniature versions of their collegiate counterparts.

The successful implementation and maintenance of the National High School Sports-Related Injury Surveillance Study demonstrates the value of a national injury surveillance system at the high school level. Dr. Comstock and her research staff are committed to maintaining a permanent national high school sports injury surveillance system.

While the health benefits of a physically active lifestyle including sports participation are undeniable, participants are at risk of injury because a certain endemic level of injury can be expected during any physical activity, especially those with a competitive component. However, injury rates among high school athletes should be reduced to the lowest possible level without

discouraging adolescents from engaging in this important form of physical activity. This goal can best be accomplished by monitoring injury rates and patterns of injury among high school athletes over time; investigating the etiology of preventable injuries; and developing, implementing, and evaluating evidence-based preventive interventions. Surveillance systems such as the model used for this study are critical in achieving these goals.