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Epidemiology of Anterior Cruciate Ligament Tears in the National Football League

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Abstract

Background: Anterior cruciate ligament (ACL) tears are common in contact athletics and have a significant effect on the athletic performance and well-being of affected players. The prevalence, timing, and characteristics of ACL tears in National Football League (NFL) athletes are lacking.

Purpose: To define the epidemiology of ACL tears among NFL athletes.

Study Design: Descriptive epidemiology study.

Methods: This retrospective study includes all ACL injuries entered into the NFL injury database through the centralized leaguewide electronic health record system for the 2015–2019 seasons.

Results: A total of 314 ACL injuries occurred during the 5-year study period, with a mean of 62 per year. The overall 1-season injury risk of an NFL player sustaining an ACL injury was 1.9% (95% CI, 1.7%−2.1%). Most ACL injuries occurred during games (n = 199), with a higher rate observed in the preseason games as compared with the regular season games (6.1 vs 2.7 per 10,000 player-plays; $P < .01$). NFL players with ≤3 of experience had a higher preseason injury rate (9.57 ACL tears per 1000 player-seasons) than those with ≥4 years of experience (5.12 ACL tears per 1000 player-seasons; $P < .01$). NFL athletes playing on special teams had the highest rate of ACL injuries (7.6 per 10,000 player-plays) in comparison with all other player positions.

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Conclusion: ACL injury incidence was fairly consistent across all years studied and occurred more frequently in players with ≤3 years of NFL experience. Tears were more common during games, special teams play, and the preseason.

Keywords

knee; ACL injury; NFL; football; epidemiology

Anterior cruciate ligament (ACL) injuries are devastating to National Football League (NFL) athletes, as they result in shorter career length[17] and an increased risk for knee osteoarthritis and long-term pain.[4,19] While approximately two-thirds of NFL athletes return to play after ACL reconstruction,[18] many often perform at a lower level then they did preinjury.[3]

While a number of previously published studies described the incidence and epidemiology of ACL injuries in NFL players,[6,8,9,16] they were based on data sourced from publicly reported injury information, which can be inaccurate and incomplete.[14] As such, the true incidence and epidemiology of ACL injury in NFL players are not well-described. Understanding the incidence and epidemiology surrounding ACL injury is the first step toward identifying targets for potential injury reduction strategies to reduce the incidence and burden of these injuries in NFL athletes. Therefore, the purpose of this article is to describe the epidemiology of ACL tears among NFL athletes, to better understand the incidence, timing, and epidemiology of these injuries in this unique cohort.

METHODS

Study Design and Population

This study used a retrospective observational design to examine ACL injuries in NFL players. All NFL players were included who played in at least 1 NFL game or sustained an ACL injury during NFL participation from 2015 to 2019. ACL injury data were collected prospectively from each of the 32 teams' medical staff and entered into the leaguewide electronic health record under mandated standardized data collection guidelines. Information was collected regarding injury severity, player position at time of ACL injury, injury timing (preseason, regular season, postseason), injury setting (practice, game, conditioning), and return to participation. Thorough data quality reviews were performed, including regular reporter training, monthly data quality audits, frequent queries to flag inconsistencies or irregularities, and comparisons with media reports and game video.[7] The NFL electronic health record is linked to sport-related information from the NFL Game Statistics and Information System, which provides game exposure information for teams and individual athletes at the game and play levels (type of play and total number of plays). This study was reviewed and approved through the NFL Player Scientific and Medical Research Protocol[13] and by the Mt Sinai Institutional Review Board (study 76-0001[0008]X).

All ACL injuries reported as football related were included in this study, regardless of severity or missed time. ACL injuries were designated as partial or complete. This partial or complete tear designation was made by team medical staff and not specifically defined.

Covariates

ACL injury incidence is described overall and by the following: injury characteristics (injured side [right or left], severity [partial or complete], treatment [ACL reconstruction or not]), timing within the season (season and week), injury setting (game, practice, conditioning, other), play type (pass, run, punt, kickoff, extra point, field goal), and player characteristics (demographics, position at time of the injury, number of years in the NFL). Injuries were included across the full NFL season, including off- and in-season injuries (preseason, regular season, postseason). Timing of injury by week in the season was based on each club's game schedule, and a "week" began the day after the club's prior-week game and ended after the club's game in that week (eg, regular season week 1 began on the day after the club's preseason week 4 game and ended after the club's regular season week 1 game). Training camp is also reported and includes approximately 2 weeks of practices before the first preseason game. Incidence is cited by year and as 5-year averages to highlight changes that may occur over time.

Player demographics are described and include age at the time of injury, weight (pounds), height (inches), and body mass index (BMI). Body weight, height, and BMI were recorded at the time that the player joined the team with whom he sustained the ACL injury. Position was recorded in 2 ways: (1) position at the time of injury, which includes an aggregated "special teams" position for any player who was participating in a special teams play at the time of injury, and (2) the player's roster position, for which "special teams–specific positions" include kicker, punter, punt returner, and long snapper.

ACL injuries occurring in practice were broken down by timing within the season and team activity at time of the injury (11 on 11, 1 on 1, special teams). Similarly, injuries during games were broken down by timing in the season, play type, and quarter of the game in which the injury occurred.

Statistical Analysis

Descriptive statistics were calculated, including counts, percentages, means, and SDs. The 1-season injury risk was defined as the number of players who sustained an ACL injury in each year (2015–2019) divided by the total number of eligible player-seasons. The total number of eligible player-seasons (N = 16,403) included the sum of unique player signings within each NFL season, regardless of duration of participation within that season (2015, n = 3278; 2016, n = 3288; 2017, n = 3337; 2018, n = 3333; 2019, n = 3167). Incidence rates were calculated for game-related injuries as the total number of ACL injuries per 10,000 player-plays to account for the number of plays in which each player participated and as the total number of ACL injuries per 1000 plays when calculating incidence rate by play type. Injury rates per player on the preseason roster were calculated as the number of players who sustained an ACL tear divided by the number of players who were on a roster for at least 5 consecutive days in preseason. The exact binomial distribution was used to calculate 1-season injury risk and accompanying 95% CIs. The binomial distribution was used to test whether the number of ACL tears on each side was equal. Poisson regression was used to calculate incidence rates per 10,000 player-plays or 1000 plays, incidence rate ratios (IRRs), and accompanying confidence intervals.

RESULTS

ACL Injury Incidence

A total of 314 ACL injuries occurred in the NFL during the 2015–2019 seasons, with an average of 62 per year and a relatively consistent number reported each year (range, 53–68) (Table 1). The overall 1-season risk of sustaining an ACL injury to an NFL player was 1.9% (95% CI, 1.7%−2.1%).

ACL Injury Characteristics

An equal number of tears ($\chi^2 = 0.01$; $P = .91$) occurred in the right (n = 156) and left (n = 158) knees. The majority of ACL injuries (90%) were complete in nature, and 100% of the complete tears were treated with an ACL reconstruction. Of the 31 partial tears reported during the 5-year study period, 61% were treated with an ACL reconstruction (Table 1).

ACL Tears by Player Characteristics

The demographics of players sustaining an ACL injury were relatively consistent across the 5-year study period, with an average age of 25.5 years, weight of 241 lb, height of 74 in, and body mass index of 31 (Table 1).

The greatest number of tears occurred while players were on special teams (24%), defensive secondary (14%), offensive line (13%), and defensive line (12%) (Table 1). Players with ≤3 years of service had 236 ACL injuries in 10,557 unique players-seasons during the 2015–2019 season (player-seasons generated from preseason rosters), while players with ≥4 years of service had 78 injuries in 4879 unique player-seasons.

ACL Injury Timing

Most injuries occurred during the regular season (48%) and preseason (40%), with fewer injuries during the off-season (11%) and postseason (1%). Most ACL injuries happened during games (63%) as compared with practices (35%) or conditioning (1%). Of the 281 ACL injuries in the 2015–2019 preseason, regular season, and postseason, the largest number took place during preseason game week 1 (n = 22; 8%) and preseason game week 2 (n = 30; 11%), accounting for approximately 19% of the total number of ACL injuries (Figure 1). A significant number of ACL injuries also occurred during training camp (n = 41; not depicted in Figure 1), accounting for approximately 15% of ACL injuries. In total, approximately 35% of all ACL injuries happened during the first 4 weeks of the preseason. In the postseason, only 5 ACL injuries were reported across 5 years.

Game-Related ACL Tears

The number of ACL injuries during games was fairly consistent from the 2015 season through the 2019 season (Figure 2). The overall game ACL injury incidence rate during the 5 seasons was 3.3 per 10,000 player-plays or 1.2 per 1000 player-games (Table 2). While the number of ACL injuries during the regular season was higher than in preseason, the ACL injury rate for preseason games was greater than for regular season games (6.1 vs 2.7 per 10,000 player-plays; IRR, 2.30 [95% CI, 1.72–3.07]; $P < .01$).

The number of ACL injuries was similar for all quarters of the game (quarter 1, n = 43; quarter 2, n = 51; quarter 3, n = 53; quarter 4, n = 51), with the exception of overtime, where there was only 1 ACL injury during the 5 years. Player position, however, did influence ACL injury rate, with the highest rates for special teams–specific players (7.6 per 10,000 player-plays) and running backs (5.8 per 10,000 player-plays) (Table 3). When game-related ACL tears were examined by play type, punting had a substantially higher rate of injury (2.19 per 1000 plays) as compared with all other play types: punts vs kickoffs (IRR, 2.26 [95% CI, 1.25–4.09]; $P = .01$) and punts vs all other play types combined (IRR, 3.35 [95% CI, 2.31–4.86]; $P < .01$) (Table 4).

Practice-Related ACL Tears

A total of 111 ACL tears were reported during a practice over the 5-year study. The incidence of practice-related ACL tears was consistent across the 5 seasons (Table 5). Approximately 50% of practice-related ACL injuries occurred in the preseason, as compared with only 23% during the regular season. Off-season practices accounted for a similar number of ACL tears (n = 30; 5-year average/season, n = 6) as compared with practice during the regular season (n = 26; 5-year average/season, n = 5.2) over the 5-year study. The majority (55%) of practice-related ACL injuries happened during a full scrimmage (ie, 11-on-11 play), with the second most during special teams play (20%) (Table 6). Among the 22 injuries sustained during special teams plays in practice, 11 (50%) took place on punt plays and 10 (45%) on kickoff plays; there was 1 additional ACL tear on a special teams play in practice, but the play type is unknown.

ACL Tears by Years of NFL Service and Season

Players with ≤3 years of experience accounted for the majority of ACL tears (80%; n = 101) during the preseason, with 55% (n = 69) in rookies and players with 1 year of experience (Table 7). This trend held when accounting for the number of players in each category who were on a roster for at least 5 consecutive days in preseason. Players with ≤3 years of experience had a rate of 9.57 preseason ACL tears per 1000 player-seasons, as compared with 5.12 preseason ACL tears per 1000 player-seasons among those with ≥4 years of experience (IRR, 1.87 [95% CI, 1.21–2.89]; $P < .01$). Similar trends were noted for the in-season (71%; n = 110) and off-season (76%; n = 25), with the majority of tears in players with ≤3 years of experience (Table 7). Rookies and players with 1 year of experience accounted for 40% of in-season and 55% of off-season tears.

DISCUSSION

The current study on ACL injury in the NFL reports the incidence, type of player, setting, timing, and epidemiology related to the occurrence of this condition. Key findings include a higher incidence of ACL tears among NFL players with fewer years of experience, a high ACL injury rate for special teams players (particularly during punts), and a higher rate of game-related ACL tears occurring in the preseason.

Players with fewer years of experience in the NFL sustained more ACL injuries than those with more experience, and this trend held true across all seasons of play. In fact, our study

shows that 47% of all ACL injuries occurred in players with ≤1 year of NFL experience, and this number increased to 75% if players with ≤3 years of NFL experience were considered. A variety of factors, including level of conditioning, playing experience, and the desire to "prove themselves," could place younger players at higher risk of injury. It is also possible that when players with certain anatomic risk factors for ACL injury (eg, decreased ACL volume[20] and increased posterior tibial slope[1]) begin practicing and competing at an elite level such as the NFL, the ACL fails in the early years after joining the league because of the inherent risk.

Players on special teams carried the highest risk (7.6 per 10,000 player-plays) of sustaining an ACL injury during a game. A previous report[2] noted that approximately 20% of all in-game ACL injuries occur during special teams play, and this is similar to our finding of 24%. Special teams play involves running over relatively long distances with a high propensity for change of direction and collisions, both of which can contribute to an increased risk of an ACL tear. The game-related ACL injury rate for players involved in punt plays was even higher (more than double) than for other types of special teams play, such as kickoffs. Future studies, such as a video review of these injuries, may allow for a better understanding of why special teams play leads to greater ACL injury risk.

Running backs had a relatively high injury rate (5.8 per 10,000 player-plays), second only to that of special teams players. Running backs often need to change direction with cutting and pivoting and may be at greater risk for unanticipated perturbations when they are tackled, both of which could contribute to their higher incidence and rate of ACL injury. The heightened rate of ACL tears in NFL running backs is supported by a previous study[2] showing that 31.6% of ACL tears in offensive players were experienced by running backs.

The rate of game-related ACL injuries was substantially higher in the preseason as compared with the regular season (6.1 vs 2.7 per 10,000 player-plays). Furthermore, 35% of all ACL injuries occurred from training camp through week 2 of preseason, a larger proportion than other weeks during the NFL season. These statistics suggest a heightened risk of incurring an ACL tear during preseason/training camp play. There are several reasons why this could be the case, including a greater number of free agents and larger roster sizes earlier in the preseason, less-than-optimal off-season conditioning or too much conditioning, and too many game-type play and drills early in the preseason. The skill level of the players may contribute to heightened susceptibility of ACL tears, given that 69 of the 126 (55%) ACL injuries recorded in the preseason occurred in players with ≤1 year of service in the NFL. This suggests that players with less familiarity with NFL-style play are sustaining a large percentage of the preseason tears and could be targeted with prevention efforts.

The higher rate of ACL injury in less experienced players, the preseason, and special teams play may all be related. Less experienced players are more likely to play in the preseason than during the regular season and are more likely to have special teams duty. Whether 1 or all of these associations are causal or coincidental is impossible to ascertain from this analysis. More research is needed to better understand why these factors relate to the risk of ACL injury and what, if anything, can be done to mitigate the risk.

Game-related ACL injuries were more common than practice-related injuries, with .60% of injuries occurring each year in games. A higher incidence of ACL injuries during games is not surprising given that others have reported similar findings in NFL players,[6] NCAA (National Collegiate Athletic Association) football athletes,[5] and other sports played at the high school[12] and collegiate[11] levels. The greater number of injuries during game play seems logical given that player intensity and effort are generally considered to be higher in games than in practices and may increase the risk of injury.

The number of ACL injuries were consistent across the 4 quarters of a game, which is in contrast to previous data suggesting that more ACL tears occur in the second and third quarters of play in NFL and NCAA collegiate athletes, respectively.[2,21] The conflicting data in NFL players are likely the result of data-gathering methods in previous reports (ie, public), while the discrepancy between NFL and NCAA football athletes could be explained by the different populations of study. The lack of difference in ACL injury by quarter seems to suggest that ACL injury among NFL players in games may not be related to neuromuscular fatigue, which has been touted as a possible ACL injury mechanism.[15] Furthermore, ACL injury incidence does not increase over the course of the season (Figure 1), lending credence to the tenet that cumulative fatigue is not likely to be a strong risk factor for ACL injury in these NFL athletes.

In regard to practice-related ACL tears, most occurred during the preseason (49%). This finding might be attributed to a greater number of practices in the preseason, longer practice times, more player-to-player contact, and/or a higher amount of conditioning occurring during preseason as compared with regular season practices. The nature of preseason practices is quite different from regular season practices, given that preseason practices serve as tryouts for a large number of players, while in regular season practices, players have already made the team and are focused on recovering from the previous game and preparing for the next opponent. Thus, effort level exerted by players is likely to be vastly higher in preseason practice and may help to explain the larger number of injuries.

Full-team scrimmaging accounted for the majority (55%) of practice-related ACL injuries and may be the result of more player contact and higher levels of player effort during these simulated game situations. Special teams play counted for a significant percentage (20%) of ACL injuries during practice, similar to the high rate of ACL injury for special teams' players occurring in games.

Given the incidence of ACL injuries in the NFL and the high cost of these injuries to individual players (loss of salary, early end to career, etc) and teams, identification and implementation of prevention strategies are needed. Review of the literature reveals a lack of data on the efficacy of ACL injury prevention strategies for elite athletes, American football athletes, and even male athletes in general. The ACL injury prevention strategies that have been shown to be effective are focused primarily on younger female athletes[10]; their translation for efficacy in NFL athletes is unknown. Future research efforts must begin to identify prevention strategies to reduce ACL injuries in these NFL athletes.

These findings may help identify opportunities to reduce the risk of ACL injuries in athletes, particularly for elite football players. For example, the nature of ACL injuries occurring during special teams deserves further study to identify potential injury prevention strategies. The heightened risk for ACL injuries during training camp and the preseason is another area that could benefit from investigation. Understanding mechanisms of injuries during these parts of the season, particularly in conjunction with the player experience, may allow for the development of definitive recommendations. Finally, given that players with fewer years of experience sustain more ACL tears than more experienced players, research is needed to understand whether targeted conditioning programs or prevention protocols could reduce their risk.

Limitations

Data regarding ACL injuries occurring before a player's time in the NFL are not reported in the electronic health record in a consistent manner. As such, assessment of recurrence and retear of previous ACL reconstructions was not available for this analysis, and some of the tears may be recurrence of an injury that occurred before the player's professional football career. Additionally, not all players remain on a roster and at risk for injury throughout the full season. Injury rates per player in preseason include all players who were on a roster for at least 5 consecutive days in preseason; however, some players may not have been on a team for the full preseason. In addition, game participation and practice exposure vary across players. While practice injuries were examined, practice participation/exposure data were not available. Data on body weight, height, and BMI were recorded at the time that the player joined the club and may have changed by the time that the injury occurred. The designation of an ACL injury as partial or complete was made by team medical staff and not confirmed by imaging or intraoperative review; therefore, there may have been instances where an injury designated as partial was actually complete. Subsequently, identification/definition of a partial tear may not be standardized across this population.

These data are based on team medical staff data entry into the electronic medical record and did not include imaging or intraoperative confirmation in all cases. Data on pathologies accompanying the ACL tears (meniscal tears, subchondral bone contusions, etc) were not included in this article. Future analyses that are focused on a detailed image review are a key next step to better understanding concomitant injury as well as the risk of recurrent ACL tears. Future research is needed to better understand the specific mechanism of injury.

CONCLUSION

ACL injuries occurred at consistent rates among NFL players across the 5-year study period. Preseason games and special teams play have elevated injury rates as compared with other settings, as do players with fewer years of NFL experience. These findings suggest that there is an opportunity to develop targeted ACL injury prevention strategies that are optimized for elite American football players.

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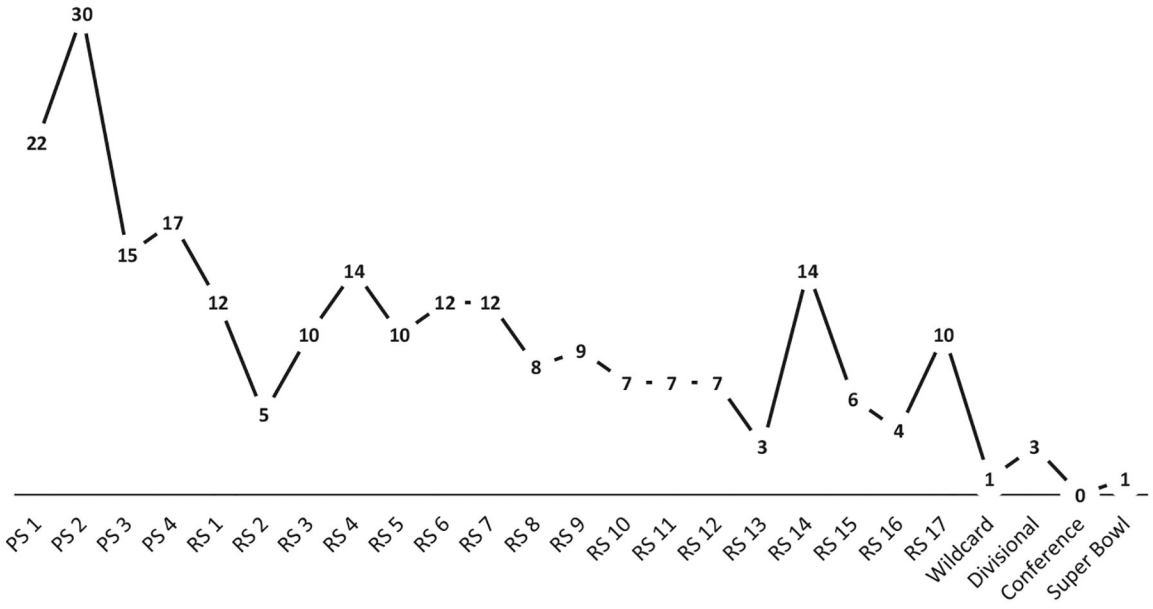

Figure 1.

Anterior cruciate ligament tears in the National Football League by week of the season, 2015–2019. The *x*-axis refers to the week of season. PS, preseason; RS, regular season.

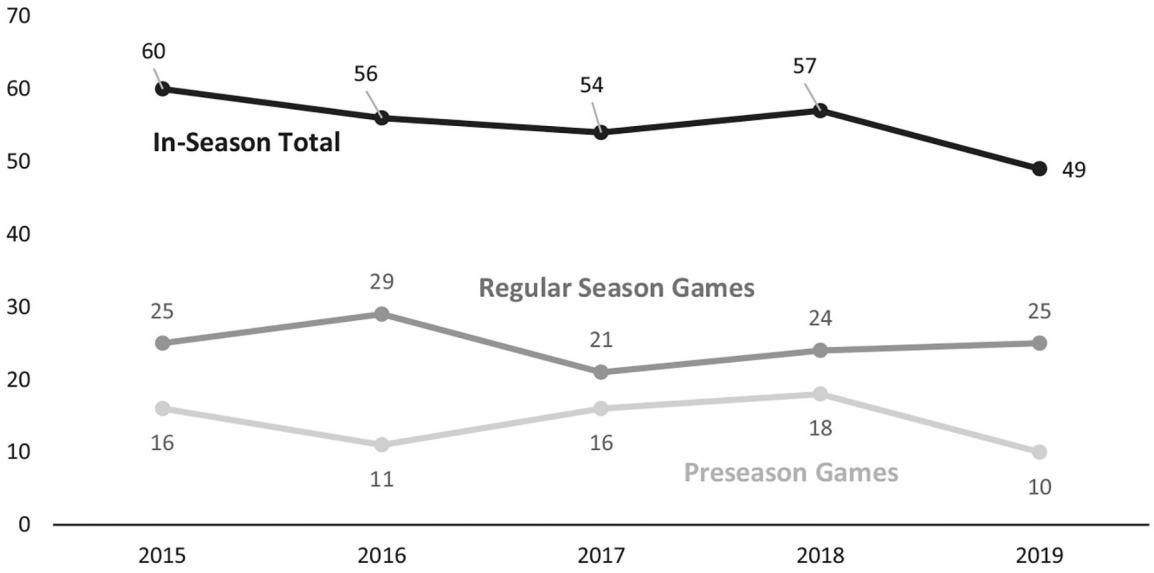

Figure 2.
Number of National Football League game-related anterior cruciate ligament injuries, 2015–2019.

TABLE 1

ACL Injuries in the NFL, 2015–2019[a]

	2015	2016	2017	2018	2019	5-y Average
ACL injuries	68	65	61	67	53	62.8
Side of injury						
Right	35 (51)	26 (40)	34 (56)	36 (54)	25 (47)	31.2 (50)
Left	33 (49)	39 (60)	27 (44)	31 (46)	28 (53)	31.4 (50)
Severity						
Partial	6 (9)	9 (14)	3 (5)	5 (7)	8 (15)	6.2
Complete	62 (91)	56 (86)	58 (95)	62 (93)	45 (85)	56.6
Tears treated with ACL reconstruction						
Partial[b]	3 (50)	5 (56)	2 (67)	3 (60)	6 (75)	3.8
Complete	62 (100)	56 (100)	58 (100)	62 (100)	45 (100)	56.6
Position at time of injury						
Offensive line	10	10	7	7	7	8.2
Running back	4	2	5	5	5	4.2
Tight end	5	6	0	5	4	4
Quarterback	2	4	3	1	0	2
Wide receiver	6	6	7	5	5	5.8
Defensive secondary	13	8	9	11	4	9
Defensive line	9	9	5	9	7	7.8
Linebacker	4	4	6	8	10	6.4
Special teams	13	16	19	16	11	15
Unknown/missing	2	0	0	0	0	0.4
No. of years in NFL						
0 (rookie)	12	17	19	14	13	15
1	16	14	13	15	16	14.8
2	9	11	6	13	8	9.4
3	6	10	8	11	5	8
4	7	5	3	6	2	4.6
5	1	1	4	3	3	2.4

	2015	2016	2017	2018	2019	5-y Average
6	7	2	1	2	3	3
≥7	10	5	7	3	3	5.6
Player demographics						
Age, y	26.1 ± 2.8	25.6 ± 2.4	25.6 ± 3.2	25.2 ± 2.5	25.1 ± 2.1	25.5 ± 2.6
Mass, lb[c]	241.5 ± 40.8	243.0 ± 41.0	234.8 ± 42.4	241.4 ± 38.8	245.7 ± 37.4	241.3 ± 40.1
Height, in[c]	73.9 ± 2.9	74.1 ± 2.3	73.3 ± 2.6	73.7 ± 2.3	74.4 ± 2.2	73.9 ± 2.5
Body mass index	30.9 ± 3.8	31.0 ± 4.2	30.5 ± 4.0	31.1 ± 3.9	31.1 ± 3.8	30.9 ± 3.9
Season						
Off-season	8	8	4	10	3	6.6
Preseason	30	20	31	28	17	25.2
Regular season	30	36	23	29	32	30
Postseason	0	1	3	0	1	1
Injury setting						
Practice	24 (35)	24 (37)	22 (36)	24 (36)	17 (32)	22.2
Game	41 (60)	41 (63)	39 (64)	42 (63)	36 (68)	39.8
Conditioning	3 (4)	0 (0)	0 (0)	1 (1)	0 (0)	0.8

[a]Values are presented as No. (%) or mean 6 SD. ACL, anterior cruciate ligament; NFL, National Football League.

[b]Treatment for partial ACL tears cannot capture surgical treatment that has not yet occurred. It is possible that the number of ACL reconstructions for partial tears is underreported by the clubs.

[c]Weight and height reflect values recorded at the time when the player joined the club where he was injured.

TABLE 2

Incidence of Game-Related NFL ACL Tears, 2015–2019[a]

		Game Injury Rate (Incidence Rate) per 10,000 Player-Plays			Game Injury Rate (Incidence Rate) per 1000 Player-Games		
	Game Injuries	Player-Plays	Rate	95% CI[b]	Player-Games	Rate	95% CI[b]
Total	199	6,021,800	3.3	2.9–3.8	163,856	1.2	1.1–1.4
Preseason	71	1,161,463	6.1	4.8–7.7	44,431	1.6	1.3–2.0
Regular season	124	4,657,243	2.7	2.2–3.2	114,428	1.1	0.9–1.3
Postseason	4	203,094	2.0	0.7–5.2	4997	0.8	0.3–2.1

[a]ACL, anterior cruciate ligament; NFL, National Football League.

[b]Poisson 95% CIs.

TABLE 3

Game-Related NFL ACL Injury Rates by Roster Position, 2015–2019[a]

		Game Injury Rate (Incidence Rate) per 10,000 Player-Plays		
	No. of ACL Tears	Player-Plays	Rate	95% CI[b]
Overall	199	6,021,800	3.3	2.9–3.8
Special teams[c]	7	91,505	7.6	3.6–16.0
Running back	20	346,641	5.8	3.7–8.9
Tight end	14	366,589	3.8	2.3–6.4
Linebacker	33	914,407	3.6	2.6–5.1
Defensive line	29	829,158	3.5	2.4–5.0
Quarterback	8	229,465	3.5	1.7–7.0
Wide receiver	22	658,444	3.3	2.2–5.1
Defensive secondary	41	1,361,138	3.0	2.2–4.1
Offensive line	25	1,224,446	2.0	1.4–3.0

[a]ACL, anterior cruciate ligament; NFL, National Football League.

[b]Poisson 95% CIs.

[c]Roster position for special teams includes kicker, punter, and long snapper.

TABLE 4

Incidence of Game-Related NFL ACL Injuries by Play Type, 2015–2019[a]

		Game Injury Rate (Incidence Rate) per 1000 Plays		
	No. of ACL Tears	Plays	Rate	95% CI[b]
Overall	199	257,334	0.77	0.67–0.89
Punt	34	15,522	2.19	1.57–3.07
Kickoff	16	16,506	0.97	0.59–1.58
Pass	88	123,897	0.71	0.58–0.88
Run	52	87,681	0.59	0.45–0.78
Extra point	1	7402	0.14	0.02–0.96
Field goal	1	6326	0.16	0.02–1.12
Unknown	7	—	—	—

[a]Dashes indicate that injury rates were not calculated for unknown injuries. ACL, anterior cruciate ligament; NFL, National Football League.

[b]Poisson 95% CIs.

TABLE 5

Incidence of Practice-Related ACL Tears by NFL Season, 2015–2109[a]

	Off-season	Preseason	Regular Season	Postseason	Total
2015	6	13	5	0	24
2016	8	9	7	0	24
2017	4	15	2	1	22
2018	9	10	5	0	24
2019	3	7	7	0	17
Total	30	54	26	1	111

[a]ACL, anterior cruciate ligament; NFL, National Football League.

TABLE 6

Team Activity at the Time of Practice-Related NFL ACL Injuries, 2015–2019[a]

Team Activity	No.	%
11 on 11	61	55
Special teams	22	20
1 on 1	13	12
Small-side scrimmage[b]	12	10
Unknown	2	2
Individual	1	1

[a]ACL, anterior cruciate ligament; NFL, National Football League.

[b]Small-side scrimmage reflects 9-on-9, 9-on-7, and 7-on-7 team play.

TABLE 7

Player Years of Service for ACL Tears by NFL Season, 2015–2019[a]

Years of Service	Preseason	In-season	Off-season	Total
0 (rookie)	37	29	9	75
1	32	33	9	74
2	20	23	4	47
3	12	25	3	40
4	4	15	4	23
5	4	6	2	12
6	7	7	1	15
7 +	10	17	1	28
Total	126	155	33	314

[a]Values are presented as No. of injuries. ACL, anterior cruciate ligament; NFL, National Football League.