ACL Injuries in Major League Soccer: A 10-year Analysis of Injury Rate and Return to Play

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BACKGROUND

- Anterior cruciate ligament (ACL) injuries are significant in Major League Soccer (MLS) athletes, impacting player availability and performance.
- Understanding ACL injury patterns and recovery timelines can help optimize rehabilitation protocols and player management strategies in professional soccer.

PURPOSE

This study analyzes the incidence of ACL injuries and the timelines for return-to-play (RTP).

➔ Examine the incidence of ACL injuries in MLS athletes.

➔ Assess RTP timelines following ACL reconstruction.

➔ Identify factors associated with RTP duration.

➔ Evaluate post-injury performance.

METHODS

- MLS Injury Surveillance database was queried for ACL injuries from 2010-2021.
- ACL injury definition: injury involving ACL, with or without co-ligament involvement, requiring medical attention
- Demographic and injury characteristics were collected for descriptive analysis.
- Matched-cohort design:

- Injured athletes were matched to uninjured controls (1:3 ratio).

- Matching based on position, age, season of injury, and baseline statistics

- Performance analysis:

  - First 4 full seasons post-injury compared to pre-injury baseline

- Statistical analysis:

  - Univariate 2-group comparisons performed using independent t-tests.

RESULTS

Table 1. Baseline Characteristics and Performance Metrics Analysis

Table 1A: Baseline Characteristics

	Average Time to RTP (Days)	Average Games Missed	P-value
Field Type			P = 0.460; 0.390
Grass, N = 94	246.7	18.3	
Artificial Turf, N = 31	243.9	17.5	
Position			P = 0.530; 0.978
Midfielder, N = 35	276.1	17.2	
Forward, N = 28	267.1	17.2	
Defender, N = 43	229.3	16.6	
Years of Injury			**P = 0.044; 0.024**
2010-2015, N = 74	269.6	19.4	
2016-2021, N = 70	219.0	14.4	
Injury Onset			P = 0.162; **0.024**
Acute (Contact), N = 47	265.0	20.7	
Acute (non-contact), N = 69	234.1	15.6	
Field Location			P = 0.380; 0.074
Home, N = 51	244.7	16.6	
Away, N = 55	256.8	20.3	
Concurrent Pathology			P = 0.432; 0.131
Yes, N = 56	244.9	20.8	
No, N = 92	240.2	18.3	
Weather			P = 0.209; 0.278
Clear/Sunny, N = 60	261.0	17.8	
Cloudy/Rainy, N = 13	209.1	13.4	

Table 1B: Performance Metrics

Attacker Metrics: Δ from Pre-Injury Season

	Control	Injured	p	Control	Injured	p
	Games Played			Assists		
1y after injury	-5.0	-7.8	0.59	-1.0	-1.0	0.50
2y after injury	-5.92	-1.29	0.21	-1.17	0.29	0.21
3y after injury	3.50	-3.50	0.20	0.75	-3.00	0.14
4y after injury	-2.50	-10.50	0.26	-0.67	-4.00	0.23
	Minutes Played			Scoring Attempts		
1y after injury	-451	-753	0.21	-12.6	-19.7	0.26
2y after injury	-222	-342	0.40	-2.75	-12.14	0.23
3y after injury	**445**	**-787**	**0.04**	**18.6**	**-28.5**	**0.01**
4y after injury	4.5	-1076	0.23	-0.17	-28.5	0.11
	Goals			Total Offsides		
1y after injury	-1.8	-3.5	0.24	**-3.3**	**-8**	**0.04**
2y after injury	-1.08	-1.57	0.43	-0.33	-5.43	0.08
3y after injury	**2.38**	**-3.50**	**0.03**	**3.38**	**-10.25**	**0.01**
4y after injury	**0.67**	**-6.5**	**0.03**	0.33	-7.0	0.09

Midfielder Metrics: Δ from Pre-Injury Season

	Control	Injured	p	Control	Injured	p
	Games Played			Assists		
1y after injury	-2.84	-3.33	0.45	-0.97	-1.27	0.41
2y after injury	-4.03	-3.73	0.47	-1.03	0.18	0.10
3y after injury	-4.80	2.40	0.09	-1.10	0.60	0.08
4y after injury	-7.43	-5.50	0.42	-1.57	0.25	0.13
	Minutes Played			Scoring Attempts		
1y after injury	-290	-435	0.31	-9.51	-9.40	0.49
2y after injury	-423	-495	0.40	-9.24	6.45	0.36
3y after injury	-437	29.6	0.07	**-12.25**	**2.80**	**0.03**
4y after injury	-565	-229	0.32	-12.14	-3.75	0.29
	Goals			Accurate Pass %		
1y after injury	-1.49	-0.67	0.22	13.56	0.13	0.15
2y after injury	-1.03	0.18	0.10	11.32	16.36	0.34
3y after injury	-1.20	2.60	0.08	**11.35**	**-2.52**	**0.03**
4y after injury	**-1.71**	**3.00**	**0.03**	11.21	-19.38	0.06

Defender Metrics: Δ from Pre-Injury Season

	Control	Injured	p	Control	Injured	p
	Games Played			Assists		
1y after injury	**-0.46**	**-4.67**	**0.05**	-0.08	-0.11	0.48
2y after injury	**-3.78**	**2.5**	**0.04**	-0.34	0.28	0.15
3y after injury	-3.08	-0.46	0.26	0.00	0.92	0.06
4y after injury	-0.74	-2.04	0.38	-0.26	0.10	0.37
	Minutes Played			Scoring Attempts		
1y after injury	-62.2	-405	0.07	0.21	-1.33	0.31
2y after injury	**-381**	**122**	**0.05**	-0.91	0.83	0.25
3y after injury	-350	2.0	0.16	-2.58	1.54	0.12
4y after injury	-165	-252	0.43	-2.05	-2.00	0.49
	Goals			Accurate Pass %		
1y after injury	0.13	-0.11	0.48	12.52	8.46	0.34
2y after injury	-0.03	0.00	0.47	17.51	17.46	0.50
3y after injury	-0.33	0.38	0.15	22.01	26.17	0.37
4y after injury	-0.42	-0.40	0.48	28.87	25.13	0.42

Key findings:

- 146 ACL injuries recorded in 138 MLS players (2011-2021).
- Median RTP time: 240 days (mean: **246.5 days**).
- Faster RTP in 2016-2021 (219.0 days) vs. 2010-2015 (296.6 days) [**p=0.044**].
- Acute contact injuries led to more missed games (20.7 vs 15.6, **p=0.024**).
- Initial post-injury performance was lower vs. controls (**p<0.05**).
- By year 3, most players matched/exceeded control performance.
- Exception: Attackers played fewer minutes (**p=0.04**) and had significantly lower scoring metrics (**p<0.05**) in year 3.

DISCUSSION

From 2016-2021, ACL rehabilitation protocols in MLS led to faster RTP and lower re-injury rates vs. 2010-2015, with most players regaining or surpassing pre-injury performance by the third season, except for attackers who showed persistent declines.

- Accelerated ACL rehabilitation protocols may have contributed to faster RTP and lower re-injury rates.
- Despite overall recovery, **attackers demonstrated persistent performance deficits**, suggesting position-specific challenges in post-ACL recovery that may require tailored rehabilitation strategies.