

The Comparison of Injuries in National Football League Players (2016-2021) based on the Playing Surface: Natural Grass versus Artificial Turf

Petar Golijanin, Ryan James Whalen¹, Mark Cote², Tyler Joseph Zajac, Matthew T Provencher

¹Steadman Philippon Research Institute, ²Orthopaedics, UCONN Hlth Ctr

INTRODUCTION:

The purpose of this investigation was to analyze and sort injuries in the NFL players over 6 seasons (2016-2021) by playing surface. We hypothesized that all artificial turf types (AT) would lead to an increased number of injuries, compared to natural grass (GRASS), and when broken down to specific artificial turf types, slit film AT (AT-SLIT) will lead to a larger number of injuries compared to non-slit film AT (AT-NS) and GRASS.

METHODS: A retrospective review of publicly available data collected from the NFL injury database between 2016 and 2021 was performed. Patient demographics, history, type of injury, and stadium surface were reviewed. Injuries were classified according to the injury type and the playing surface where the injury occurred on.

RESULTS:

All the injury types were experienced at a higher rate on AT compared to GRASS. There was a rate of 0.368 ankle injuries/game on GRASS versus 0.409/game on AT, accounting for a AT-to-GRASS injury rate difference of 10.6%. Hamstring injuries on GRASS averaged 0.287/game, while AT was 0.341/game a AT-to-GRASS difference of 17.2%. There was an average of 0.121 groin injuries/game on GRASS and 0.138/game on AT, accounting for a AT-to-GRASS difference of 13.1%. There was an average of 0.055 quadriceps injuries/game on GRASS and 0.078/game on AT, accounting for a AT-to-GRASS difference of 34.6%. There was a total of 0.076 ACL injuries/game on GRASS and 0.088/game on AT, accounting for a AT-to-GRASS difference of 14.6%. There was a total of 0.054 MCL injuries/game on GRASS and 0.084/game on AT, accounting for a AT-to-GRASS difference of 43.5%. There was a total of 0.047 lower extremity fracture injuries/game on GRASS and 0.060/game on AT accounting for a AT-to-GRASS difference of 24.3%. There was a total of 0.033 Achilles injuries/game on GRASS and 0.042/game on AT, accounting for a AT-to-GRASS difference of 24.0%.

When compared AT-SLIT vs. AT-NS injuries, only MCL were less common on AT-SLIT (0.082/game vs. 0.120/game), all the other injuries were less common on AT-NS.

DISCUSSION AND CONCLUSION: During NFL games, AT surface poses a higher risk for injuries when compared to GRASS. More specifically, ankle, groin, ACL, MCL injuries, and lower extremity fractures were more common on AT. When comparing AT-SLIT versus AT-NS, AT-SLIT predisposed players to a higher rate of ankle, hamstring, and ACL injuries. Additional work is needed to determine the impact of these injuries on playing career.

Type of injury	Artificial turf	Natural grass
Ankle	Per game	0.409
		0.368
Hamstring	Per game	0.341
		0.287
Groin	Per game	0.138
		0.121
Quadriceps	Per game	0.078
		0.055
ACL	Per game	0.088
		0.076
MCL	Per game	0.084
		0.054
Lower extremity fracture	Per game	0.060
		0.047
Achilles	Per game	0.042
		0.033

Type of injury	Slit film turf	Monofilament turf
Ankle	Per game	0.512
		0.436
Hamstring	Per game	0.341
		0.413
ACL	Per game	0.132
		0.110
MCL	Per game	0.083
		0.087