

## An Analysis of Specific Lower Extremity Injury Rates on Grass and FieldTurf Playing Surfaces in National Football League Games 2000-2009 Seasons

Elliott B. Hershman, MD<sup>\*†</sup>, Robert Anderson, MD<sup>‡</sup>, John A. Bergfeld, MD<sup>§</sup>, James P. Bradley, MD<sup>||</sup>, Michael J. Coughlin, MD<sup>¶</sup>, Robert J. Johnson, MD<sup>#</sup>, Kurt P. Spindler, MD<sup>\*\*</sup>, Edward Wojtys, MD<sup>††</sup>, John W. Powell, PhD, ATC<sup>‡‡</sup> and for the National Football League Injury and Safety Panel<sup>§§</sup>

### Author Affiliations

<sup>†</sup> Elliott B. Hershman, MD, Department of Orthopaedic Surgery, Lenox Hill Hospital, North Shore-LIJ Orthopaedic Institute, North Shore-LIJ Healthcare System, 130 East 77th Street, New York, NY 10075 (e-mail: [hershmane@manhattanorthopaedics.com](mailto:hershmane@manhattanorthopaedics.com)).

James T. Collins Jr, BA, ATC (San Diego Chargers, San Diego, California); M. Anthony Casolaro, MD (Department of Medicine, Georgetown University; Pulmonary and Medical Associates of Northern Virginia Ltd, Arlington, Virginia); Thom Mayer, MD (Department of Emergency Medicine, George Washington School of Medicine, Washington, DC); Elliot Pellman, MD (ProHealthcare Associates, Lake Success, New York; Mt Sinai School of Medicine, New York, New York); William Tessendorf, MA, ATC (Sykesville, Maryland); Andrew Tucker, MD (Union Memorial Sports Medicine, Medstar Union Memorial Hospital, Baltimore, Maryland).

### Abstract

**Background:** Players in the National Football League (NFL) sustain injuries every season as the result of their participation. One factor associated with the rate of injury is the type of playing surface on which the players participate.

**Hypothesis:** There is no difference in the rate of knee sprains and ankle sprains during NFL games when comparing rates of those injuries during games played on natural grass surfaces with rates of those injuries during games played on the artificial surface FieldTurf.

**Study Design:** Descriptive epidemiology study.

**Methods:** The NFL records injury and exposure (ie, game) data as part of its injury surveillance system. During the 2000–2009 NFL seasons, there were 2680 games (5360 team games) played on grass or artificial surfaces. Specifically, 1356 team games were played on FieldTurf and 4004 team games were played on grass. We examined the 2000–2009 game-related injury data from those games as recorded by the injury surveillance system. The data included the injury diagnosis, the date of injury, and the surface at the time of injury. The injury data showed that 1528 knee sprains and 1503 ankle sprains occurred during those games. We calculated injury rates for knee sprains and ankle sprains—specifically, medial collateral ligament (MCL) sprains, anterior cruciate ligament (ACL) sprains, eversion ankle sprains, and inversion ankle sprains—using incidence density ratios (IDRs). We used a Poisson model and logistic regression odds ratios to validate the IDR analysis. A multivariate logistic regression model was used to adjust the odds ratio for weather conditions.

**Results:** The observed injury rate of knee sprains on FieldTurf was 22% (IDR = 1.22, 95% confidence interval [CI], 1.09–1.36) higher than on grass, and the injury rate of ankle sprains on FieldTurf was 22% (IDR = 1.22, 95% CI, 1.09–1.36) higher than on grass. These differences are statistically significant. Specifically, the observed injury rates of ACL sprains and eversion ankle sprains on FieldTurf surfaces were 67% ( $P < .001$ ) and 31% ( $P < .001$ ) higher than on grass surfaces and were statistically significant. The observed injury rates of MCL sprains and inversion ankle sprains were also not significantly higher on FieldTurf surfaces ( $P = .689$  and  $.390$ , respectively).

**Conclusion:** Injury rates for ACL sprains and eversion ankle sprains for NFL games played on FieldTurf were higher than rates for those injuries in games played on grass, and the differences were statistically significant.

### Keywords:

[injury epidemiology](#) [artificial surfaces](#) [ankle sprains](#) [knee sprains](#)

### Footnotes

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