

Proper cleat choice gives turf injuries the boot

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Injury on the playing field often is caused by the interaction between the athlete's shoe and the field surface. In a literature review appearing in the May 2013 issue of the *Journal of the American Academy of Orthopaedic Surgeons (JAAOS)*, researchers shed light on the evolution of synthetic playing surfaces. The study summarizes the existing research on artificial turf and the role of shoe-surface interface in injury.

Synthetic surfaces were introduced in the 1960s to improve play surface durability and accessibility, and to minimize field maintenance. Newer, "third generation" artificial surfaces behave more like grass and soil, but continue to be associated with injuries to the foot, ankle, toe and knee, in addition to concussions. Characteristics of the play surface directly affect how much energy is absorbed by the athlete upon impact.

The key to minimizing injuries on natural and artificial playing fields may be to understand the interplay between different types of [athletic shoes](#), specific sports and field surfaces.

"Optimal shoe-playing surface conditions may be level and sport-specific," said orthopaedic surgeon and lead study author Mark C. Drakos, MD. "The shoe-playing surface interface is a modifiable risk factor for injury, and further research is needed to improve playing conditions for athletes of all levels."

Determining the shoe-playing surface interface is complex and challenging as it is influenced by human factors (i.e., the athlete's body

weight, velocity and acceleration, deceleration, loading rate, and angle of the foot and height before contact), shoe factors (i.e., sole type and cleat/stud material of footwear, and number and size of cleats and cleat configuration), type of playing surface, and related environmental factors.

Other article highlights:

- Most types of shoes have higher peak torque (foot movement and movement force) on [artificial turf](#) than on natural turf.
- Sole material and cleat pattern and shape may affect torque. For example, shoes with small cleats place the lowest amount of pressure on the foot, and may potentially minimize the incidence of foot stress fractures on artificial surfaces.
- Because of constant changes in both the athletic shoe market and artificial surfaces, much of the existing research on the shoe-playing surface is outdated.

"The role of the shoe surface interface in the development of lower extremity injuries continues to be clarified," said Dr. Drakos. Optimal shoe-playing surfaces are most likely level- and sport-specific. The shoe-playing surface interface is a modifiable risk factor for injury and further research is needed to improve playing conditions for all athletes.

Provided by American Academy of Orthopaedic Surgeons

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