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## Artificial Field Turf vs Natural Grass Injuries

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### Sports Safety Concerns on Synthetic Football and Soccer Playfields

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Research examining sports injuries sustained on artificial field turf and natural grass football fields uncover a number of statistically significant differences.



Providing a playing surface compatible with player safety is a primary concern for any sporting venue. For professional football and soccer, injuries can cost a team the season or end a star player's career. What types of trauma are most prevalent on synthetic playing surfaces? Do artificial fields compromise players' safety or protect them from severe damage?

#### Artificial Field Turf Versus Natural Grass - Sports Trauma Injury Profiles

A study of injuries sustained by California high school football players found higher rates of injury on turf [Ramirez, et al. 2006]. While there were 13.8 injuries per 100 session hours on turf and only 8.4 per 100 on natural grass, the type of injury matters.

Players on synthetic turf fields are more prone to injuries such as:

- [Turf toe](#)
- Muscle trauma
- Turf burn

The increased incidence of turf toe and muscle trauma relate to surface resistance on artificial field turf. A comparison of in-shoe foot loading patterns found that turf caused higher peak pressures in the central forefoot and lesser toes, while grass had higher pressures within the medial forefoot and lateral midfoot [Ford, et al. 2006].

Wearing proper footwear can be critical to avoiding injury. A study by Livesay, et al. of peak torque and rotational stiffness found the highest torques were created by a grass shoe-FieldTurf interaction [2006]. Lowest torques were obtained on natural grass fields. A proper combination of artificial turf shoes and synthetic grass led to intermediate torques.

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The abrasive quality of the polypropylene fibers leads to more scrapes and minor injuries. While these injuries are not dangerous in isolation, turf burn may factor in serious [MRSA infections](#).

Players on natural grass fields are more likely to sustain:

- Neural injuries
- Ligament injuries
- Debris injuries

Earlier research by Meyers and Barnhill examined the rate and severity of injuries on FieldTurf brand products versus natural grass [2004]. The 5-year prospective study tracking high school football injuries found that there were "higher incidences of 1- to 2-day time loss injuries, 22+ days time loss injuries, head and neural trauma, and ligament injuries were reported on natural grass."

Another study by Naunheim, et al. found that the application setting matters [2004]. While the indoor artificial field was softer than the outdoor natural grass field, the outdoor artificial was the hardest of the three turfs studied and offered the least protection from head injury upon impact.

**Synthetic Field Turf Versus Natural Grass Sporting Fields- Reasons for Differing Safety Issues**

Early foam-based artificial turf products like AstroTurf were particularly hard surfaces with increased injury risks. New field turf products like FieldTurf, Sprinturf, SmartGrass, and Sporturf show improved compression characteristics. At the time of installation, synthetic turf exhibits superior impact attenuation compared to natural grass. This explains the reduction in severe neural and ligament injuries.

A major concern with artificial turf is research showing compression characteristics changing over time. Hard and soft spots develop, with more compact areas measuring unfavorably when compared to natural grass fields. In fact, the hardest areas on an older artificial turf sporting field can be harder than older foam-based artificial turf surfaces [Naunheim et al. 2004]. This variability may put players at greater risk over time.

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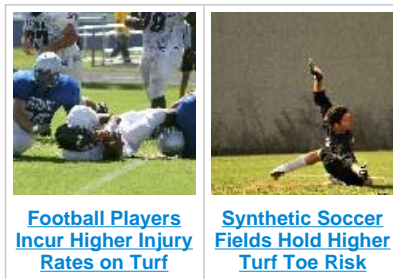
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