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Artificial Turf Versus Natural Grass

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By [James E. Voos, MD](#)

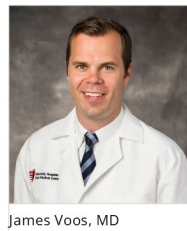
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Which is playing surface is safer for playing high school sports?

Innovations in Orthopaedics | Fall 2019

The benefits and risks associated with natural grass and artificial turf playing fields have been the subjects of multiple studies. But few have examined the safety of these surfaces in high school sports — and none have examined the risks in high school sports beyond football.

The [University Hospitals Sports Medicine Institute](#) partners with more than 50 area high schools to keep their athletes injury free. With that goal in mind, the department decided to analyze data to compare injury rates on artificial versus natural playing surfaces among high school athletes — both male and female — for all sports played on a field.



James Voos, MD

Using UH Sports Medicine Institute's school-based electronic medical record (EMR) system, physician-researchers from University Hospitals, [Case Western Reserve University](#) and UH Sports Medicine Institute analyzed data collected by 26 high school athletic trainers during the 2017-2018 athletic seasons.

They found athletes were 58 percent more likely to sustain an injury during athletic activity on artificial turf. Injury rates were significantly higher for football, girls and boys soccer, and rugby athletes. Lower extremity, upper extremity, and torso injuries were also found to occur with a higher incidence on artificial turf.

Previous studies, although less comprehensive, back the UH Sports Medicine Institute team's findings. A systematic review published last year evaluated the risk of [ACL injuries](#) in football and soccer athletes playing on artificial and natural grass surfaces. The authors found an increased rate of ACL injury in football athletes playing on artificial turf compared with natural grass, but no increased risk in soccer.

Although artificial turf quality has improved dramatically during the past five to 10 years, studies suggest athletes should take preventive measures when playing on artificial turf. "Our study highlights the need to educate high school athletes on the importance of having the right shoes and cleats," says [James Voos, MD](#), Chair of the University Hospitals [Department of Orthopaedics](#), and Associate Professor of Orthopaedics, Case Western Reserve University School of Medicine, "Schools also need to adequately maintain the turf to the appropriate quality to reduce injury risk."

STUDY DETAILS

Researchers identified a total of 953 injuries during the 2017-2018 athletic seasons, with 585 of them occurring on synthetic turf and 368 on natural grass. Researchers

then performed subgroup analysis to determine injuries that took place on artificial turf versus natural grass based on injury location (lower extremity, upper extremity, torso), sport, level of competitive play (freshman, junior varsity, varsity), and practice versus competition injuries.

Breaking it down, injuries in upper and lower extremities and torso occurred more frequently on artificial turf than on natural grass. When analyzing by sport, researchers found that football, men's lacrosse, rugby, and girls and boys soccer had higher rates of injury than other sports. Although no statistically significant difference was found in level of play, there was a higher level of competition injury compared with injuries sustained in practice.

Dr. Voos says the team plans to publish the study this year. They presented their findings at the American Orthopaedic Society for Sports Medicine (AOSSM) 2019 Annual Meeting in Boston, Massachusetts, in June 2019. With the study complete, the next step is to research the impact of factors such as turf quality, shoe wear and injury prevention programs on injury rates, especially during competition.

ARTIFICIAL TURF BENEFITS

Despite the protective benefits of natural grass fields, fewer schools use them because of the extra maintenance required and lack of flexibility. For example, if it rains on a Wednesday, students may have to stay off the field to prevent damage before a Friday night football game.

Artificial turf is easier to maintain, doesn't require water or fertilizer and can accommodate a variety of activities. With artificial turf, students can practice on the field in almost any weather without damaging the ground. Also, artificial turf doesn't freeze in the winter or thin out in the summer.

Dr. Voos says parents may want to ask coaches and athletic directors how they maintain their turf to keep students safe. "The main thing we want to emphasize is for parents and students to be aware of the difference," he adds. "Make sure kids have the right shoes in good condition, appropriate helmets and proper protective equipment."

To refer a patient to a sports medicine specialist, call [216-553-1783](tel:216-553-1783).

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