Penn State’s Center for Sports Surface Research

The SPORTSTURF SCOOP

Synthetic Turf and Staph Infections - Cause for Concern?
Synthetic Turf Role in Staph Infections

Texas-sized MRSA problem with prep football turf

Posted on Friday, December 21, 2007 at 11:07AM by Scott McPherson in Popular Culture, influenza and infectious diseases | 7 Comments | 1 Reference

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Survey of Fields

- 20 fields (summer)
- Indoor and outdoor
- High and low use areas
- All bacteria and staph bacteria
Colony forming units (CFU) detected on R2A media per gram of crumb rubber infill or rootzone

No *S. aureus* found at any test location
Surfaces that test positive (+) or negative (-) for the presence of S. aureus colonies

<table>
<thead>
<tr>
<th>Source</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Public areas</td>
<td></td>
</tr>
<tr>
<td>Human hands</td>
<td>+</td>
</tr>
<tr>
<td>Human faces</td>
<td>+</td>
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<tr>
<td>Computer mouse</td>
<td>-</td>
</tr>
<tr>
<td>Elevator button</td>
<td>-</td>
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<tr>
<td>Outside door handle</td>
<td>-</td>
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<tr>
<td>Computer keyboard</td>
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<table>
<thead>
<tr>
<th>Source</th>
<th>Result</th>
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<tbody>
<tr>
<td>Athletic training facility</td>
<td></td>
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<tr>
<td>Natural turfgrass playing field</td>
<td>-</td>
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<tr>
<td>Synthetic turf playing field</td>
<td>-</td>
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<tr>
<td>Cold pool</td>
<td>-</td>
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<tr>
<td>Blocking pads*</td>
<td>+</td>
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<tr>
<td>Sauna</td>
<td>-</td>
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<tr>
<td>Football*</td>
<td>-</td>
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<tr>
<td>Weight equipment*</td>
<td>+</td>
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<tr>
<td>Towel hamper</td>
<td>-</td>
</tr>
<tr>
<td>Stretching table</td>
<td>+</td>
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<tr>
<td>Used towels*</td>
<td>+</td>
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<tr>
<td>Trash can for drink cups</td>
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</table>

*Sampled immediately after use
How Long Can Staph Bacteria Survive on Synthetic Turf?
Outdoor Test

- Levels of bacteria quickly dropped to very low levels

- Difficult to evaluate control products (bacteria in all plots decreased quickly)

- Comparable bacteria survival rate natural grass
Indoor Test

- Bacteria survived on synthetic turf and natural grass for multiple days
- Population decreased significantly with time
- Anti-microbial treatment and detergent decreased survival rate
Summary of Studies

- Is synthetic turf a breeding ground for staph bacteria? – No!
- Sunlight appears to be best disinfectant
- Indoors – treatments can reduce bacteria
Abrasiveness of Synthetic Turf

Centers for Disease Control –
Staph spread primarily through breaks in the skin

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Abrasiveness of Synthetic Turf

- Surface/epidermal injuries 9x more common on infilled synthetic turf

Incidence, Causes, and Severity of High School Football Injuries on FieldTurf Versus Natural Grass
A 5-Year Prospective Study

Michael C. Meyers,*† PhD, FACSM, and Bill S. Barnhill,† MD
From the *Human Performance Research Center, West Texas A&M University, Canyon, Texas, and †Panhandle Sports Medicine Associates, Amarillo, Texas

Background: Numerous injuries have been attributed to playing on artificial turf. Recently, FieldTurf was cited for its playing characteristics of natural grass. No long-term study has been conducted comparing game-related ball injuries between the two playing surfaces.

Hypothesis: High school athletes would not experience any difference in the incidence, causes, and severity of injuries between FieldTurf and natural grass.

Study Design: Prospective cohort study.

Methods: A total of 8 high schools were evaluated over 5 competitive seasons for injury incidence, injury cause, injury time loss, player position, injury mechanism, primary type of injury, grade and anatomical location of the injured, head and knee trauma, and environmental factors.
Conclusions

- Staph bacteria – found on other surfaces
- No evidence of anyone getting staph infection directly from synthetic turf
- Synthetic turf - not a hospitable environment for staph bacteria
A Survey of Microbial Populations in Infilled Synthetic Turf Fields

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Dianne Petrunak, M.S., PLANT PATHOLOGY
and Thomas Sereinis, M.S., CANDIDATE IN AGRONOMY

INTRODUCTION

Staphylococcus aureus is a bacterium that is a common inhabitant of the skin, and can cause various types of skin or soft tissue infections (Marples, et al., 1979). It has been implicated in certain types of food poisoning (Bennett and Lancefield, 1990) and medical problems such as toxic shock syndrome. Strains of S. aureus resistant to common antibiotics are becoming more common, particularly in medical centers. Many reports recently of methicillin-resistant S. aureus causing infections (Carter, 2004). With the increase in athlete infections, there is growing concern over the infection characteristics of infilled turf systems (Seppa, 2005). While there is some indication that S. aureus can survive on artificial surfaces, there is no conclusive evidence that the bacteria may be more closely associated with locker room activity than with food or water (Begier, et al, 2004; Kazakova, et al, 2005).

The objective of this survey was to determine the microbial population on synthetic turf systems as well as natural turfgrass fields. In addition, samples were collected from public areas and from an athletic training facility were also sampled. Cultures positive for S. aureus were positively or negatively identified.
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