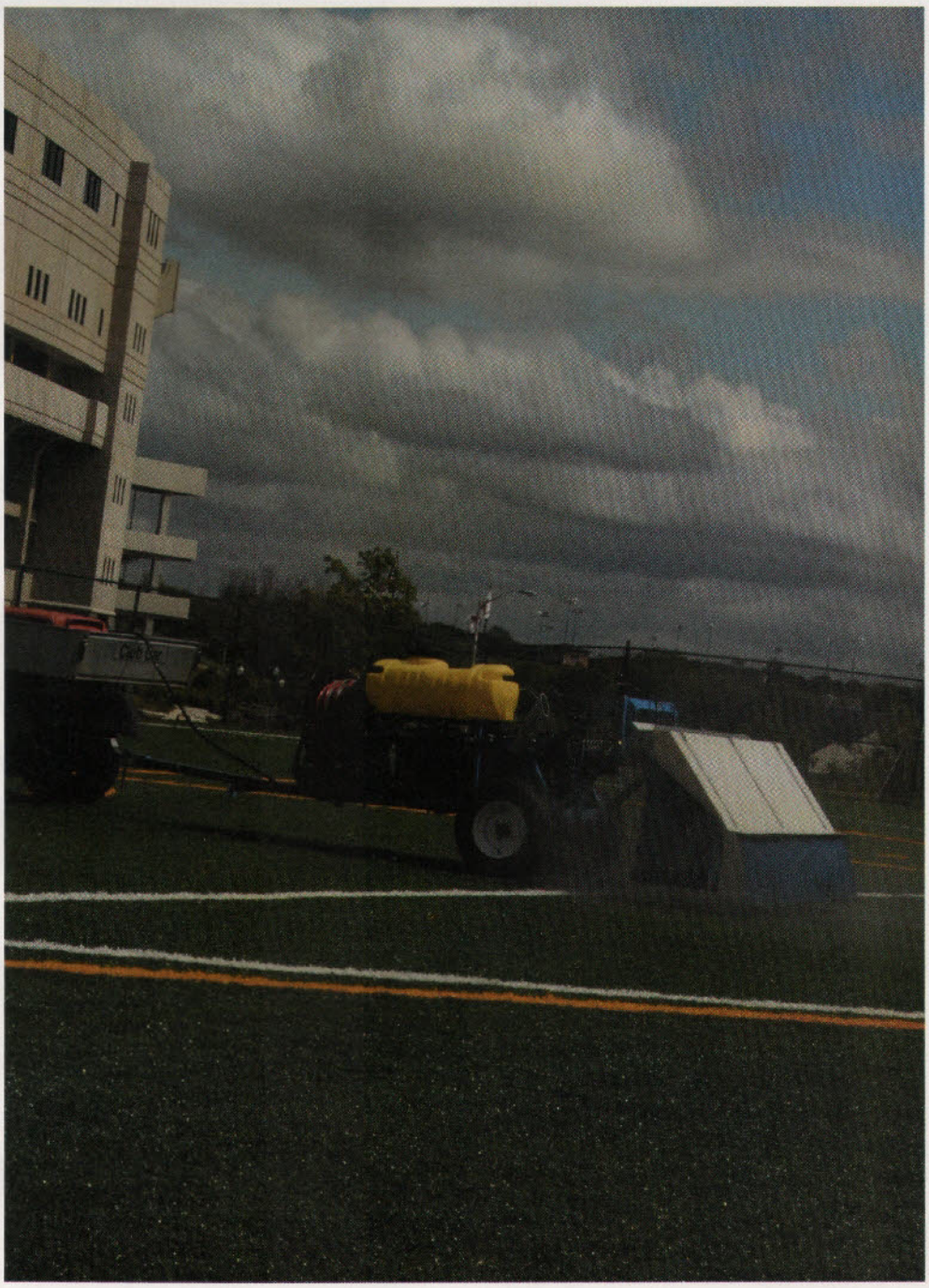
MRSA and synthetic fields: more research is in

Editor's note: In our May 2006 issue we ran a story about a study that found that "infilled systems are not a hospitable environment for microbial activity." There are other views on this subject however, including that of the manufacturer of TurfAide, an antimicrobial product marketed to owners of synthetic turf systems. In the spirit of fairness, we offered them an opportunity to present their information.



Ten Midwest high school athletes from one school last year contracted MRSA (methicillin-resistant Staphylococcus aureus), a powerful bacteria. The luckier of the bunch came out with deep scars while others emerged from hospital beds after weeks of strong antibiotics. All felt relief that the microorganism hadn't taken a bigger toll.

"When my son contracted MRSA, he had to take heavy antibiotics, bleach baths, wash with antibacterial soap, and de-contaminate all textiles that he touched, including our couches and everything in his room, with scalding hot water for weeks," says Sue Schnitz, mother of Robert Schnitz, who was one of the first to contract MRSA on the team. "We were lucky. I thought his leg would have to be amputated. Instead my son is left with bullet-sized scars on the back of his leg."

Teams from high school levels to the pros such as the Washington Redskins and Cleveland Browns have dealt with cases of staph outbreaks. All, no doubt, would tell the athletic community one simple fact: MRSA and staph infections are indeed a threat and awareness and action is a must.

MRSA defined

MRSA is a strain of the staph bacteria and is otherwise known as a "super bug" because of its resistance to methicillin. In athletics,

staph and MRSA infections create problems when scrapes, burns, and cuts are involved, enabling the bacteria to enter the body's bloodstream; instances that are far too common in sports and on synthetic turf fields.

"Athletes in all arenas need to be aware of MRSA's growing threat on the community. Staph infections are not to be taken lightly," says Dr. Rod Walters, doctor of sports education formerly at the University of South Carolina.

The bacteria usually cause mild skin infections such as boils or pimples, but by entering the bloodstream through open wounds, it can instigate infections such as sever pneumonia, internal organ and joint infections and toxic shock syndrome.

Staph, once believed to be confined to hospital settings, has over time become more resistant and increased in virulence; the Centers for Disease Control (CDC) reported that from 1995 to 2004, the percentage of staph infections caused by MRSA has increased from 22% to 63% [1]. The CDC also estimates that around 130,000 people are hospitalized with MRSA each year. This year the Archives of Internal Medicine reported that MRSA's frequent occurrence is around 11 times greater than past estimates reported [2]. Sports Illustrated states that staph is so highly contagious that a "quick high five" can transmit the bacteria if both athletes have turf burns or abrasions in their skin [3].

"A higher percentage of Staphylococcus aureus have become resistant in recent years," says Dr. Bruce Muma, chief medical officer at Henry Ford West Bloomfield Hospital. "As community outbreaks become more prevalent outside of hospitals, healthcare experts nationally are facing a crisis that needs the help of a proactive community to beat."

Where is MRSA found?

Staph infections, including MRSA, are pathogens that can be found everywhere; in fact, it lives in the skin and nose of about 30% of the population [4]. The bacteria can survive in indoor and outdoor environments and surfaces such as playgrounds, hospitals, prisons, health clubs and athletic settings for long periods (days and months). Specifically in the athletic environment, staph can live in locker rooms, whirlpools, towels, uniforms, mats, sporting equipment, and synthetic turf fields. Increasing knowledge in the medical community has brought to attention that staph can be transferred by textile and other surfaces as well as person to person contact.

Though the presence of Staphylococcus aureus in athletic settings such as locker rooms, health clubs, mats, exercise balls and weight rooms is commonly accepted in the community, it's presence on synthetic turf fields has been debated. Today, recent independent studies confirm what doctors and athletic officials have suspected all along; the non-discriminatory staph bacteria indeed can live on synthetic fields. According to the Journal of Clinical Microbiology, who clinically studied staph's ability to survive on a variety of substrates,

"Staphylococcal viability was longest on . . . polyethylene plastic (22 to 90 days)."[5]

As recent as May 2007, an independent laboratory tested an indoor synthetic turf field at a Midwest Division I school and found five samples with significant indication of presumptive staph on separate areas of the field tested [6]. Other independent studies conducted on five separate indoor and outdoor synthetic turf systems at multiple college and professional athletic facilities confirmed the presence of staph on three of the five fields tested [7]. A Clinical Infectious Disease study in 2004 showed that players who have sustained turf burns are seven times more likely to acquire an infection compared to players without turf burns [8].

Dr. Gregory M. Colores, a Department of Biology professor at Central Michigan University, states that, "CMU has been helping in the development of test techniques appropriate for the detection and characterization of bacteria from synthetic turf. Using PCR (Polymerase Chain Reaction) we have confirmed that there are detectable levels of bacteria that can be retrieved from synthetic turf surface samples."

With the presence of fluids such as sweat, blood, spit, vomit and urine or bird droppings, and high physical contact, sports played on synthetic turf fields could be an ideal place where the non-discriminatory staph bacteria can flourish or serve as a transmission point. Staph's proven ability to live on synthetic turf systems and in other athletic settings can lead to the conclusion that MRSA can survive here also. In fact, according to the New England Journal of Medicine, during the 2003 football season in which eight MRSA infections occurred among the Rams players, all of the infections developed at turf-abrasion sites [9].

Defending against MRSA

In the case of MRSA, prevention is key. The CDC offers the following tips for microbial safety:

- Keep your hands clean by washing then thoroughly with soap and water.
- Keep cuts and scrapes clean and covered with a bandage until healed.
- Avoid contact with other people's wounds or bandages.
- Avoid sharing personal items such as towels or razors.
- Regularly clean surfaces of gym equipment with disinfectant before and after use.

The antimicrobial treatment TurfAide, a product of the Sports Antimicrobial System (SAS) from SportCoatings, Rochester Hills, MI, is being used now by the Minnesota Vikings, Cleveland Browns, Ohio State University, and Virginia Tech, and many others, as well as at the high school level. SAS is designed to inhibit and minimize microbial contamination on all sport surfaces for extended periods.

SAS is a family of treatments that are powered by the ÆGIS Microbe Shield technolo-

gy, which has been safely used in consumer goods and medical applications for more than 30 years. Registered with the EPA, the shield imparts an invisible layer of antimicrobial protection that will not leach any chemicals or heavy metals into the environment and will not rub off onto a player's skin.

"Using the SAS system is like having an airbag in your car," said Mike Goforth, Director of Athletics Training at Virginia Tech "You may not be able to see it, but the parents of our athletes can feel confident knowing that their sons and daughters are training in safe facilities when they come to Virginia Tech."

On a microscopic level, the SAS treatments bond to the surface and create a matrix of positively charged sword-shaped molecules. Upon direct contact, the membrane of the microbe is physically ruptured by a stabbing and electrocution action. Since the treatment is not consumed or dissipated, it remains active 24/7. ■

Sources:

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