

Synthetic Turf Disposal and Health Concerns

To Educate The Public on Negative Aspects of Synthetic Turf Sports Fields

Tag Words: Turf; Synthetic; Disposal; Health

Authors: Mathew Rosenblatt and Daniel Wolf with Julie M. Fagan, Ph.D.

Summary

In the past, sports playing surfaces have primarily been made of natural grass. However, many of today's sports fields are made of artificial turf at both the youth and the professional level. It is not completely clear as to which playing surface is the better choice, but there are several positives and negatives of artificial turf and natural grass. Some people say that athletes are more prone to injury when playing on artificial turf compared to natural grass. If this is true, this can potentially become a major problem, as many sports teams are transitioning over to artificial turf. While injuries are a major topic of the debate, a serious issue is how artificial turf affects the environment. Artificial turf, which is made of recycled rubber, has a lifespan typically between ten and twelve years. When that lifespan is up it can either be recycled or disposed of in landfills. Sometimes, the turf is recycled and reused, but when there is no need for it, there is no other option but to dispose of it into a landfill. The problem with this is that "only 8 states have no restrictions on placing tires in landfills. The primary reasons behind these restrictions include the possibility of pest infestations and tire fires (Claudio). Another reason that artificial turf is looked at negatively is because of the chemicals that the rubber contains. The chemicals can potentially be hazardous if they come into contact with a person's skin, are inhaled through the air, or are ingested through the water supply. The turf issue should not only draw concern from sports athletes, but also from bystanders who are affected by the environmental effects of artificial turf.

By Matt Rosenblatt

Video Link

Synthetic Turf Disposal and Health Concerns:
<http://www.youtube.com/watch?v=amd3QvOUcaU>

The Issue: Turf Disposal

Sports Injuries/Skin Infections

Today many sports are making the transition from playing on natural grass to artificial turf. In the late 1960's the Houston Astros, a Major League Baseball team, introduced their new playing surface, AstroTurf. This artificial turf was installed to eliminate the tedious work of maintaining a natural playing field, especially in a domed stadium. While Astros management was successful in this aspect, they failed to consider the negative effects of the new playing surface, specifically injuries. After the new turf was installed, several players complained about the new field. In England, the English Football Association banned synthetic turf in 1988 due to concerns from athletes that the playing surface was harder than grass and caused more injuries. Even in the United States there were similar concerns, including from the National Football League. In 1995, the NFL conducted a poll that showed 93% of their players believed that playing on artificial surfaces increased their chances of suffering an injury. In the 1990's, many teams who had used artificial playing surfaces converted their fields back to natural grass. As mentioned, that trend has disappeared and teams are going back to playing on artificial turf (Claudio).

In an online baseball blog, Torii Hunter, shared a personal experience that he had playing on artificial turf in the outfield. "I heard about how great he (Andre Dawson) was in Montreal, and how the artificial turf in the Expos' park he played in for 10 years messed up his knees...I can relate to what he went through, now that I've moved from the artificial turf in Minnesota to the natural surface, God's green grass, in Southern California with the Angels. It makes a huge difference over the course of a season. I used to feel so beat up playing on that carpet. I'm really happy for the young Twins like my protégé Denard Span, who won't have to go through what I did, and what Kirby Puckett went through playing center field on that hard turf" (Hunter). When comparing the injuries on turf to the injuries on natural grass, more injuries occur on turf, but more serious injuries occur on grass. With an artificial playing surface, muscle strains, tears, and "turf toe" are more common due to more torque, velocity, and traction on the turf. Since grass is most of the time a harder playing surface, it means that there are less muscle injuries, but concussions and more serious injuries are more common (Drakos).

Another problem with artificial turf fields is the chance of catching a skin infection. It has not been proven that artificial turf fields contain the dangerous staph infection MRSA, but since turf burns are common, the likelihood of catching a bacterial infection in the wound is more likely to occur on the artificial playing surfaces. Other than injuries and skin infections, athletes must deal with the occasional extreme temperatures on an artificial turf playing field. It has been shown that temperatures can be up to 60 degrees hotter on artificial turf than on natural grass. For example, during a hot summer day a grass field had a temperature of 85 degrees while an adjacent turf field was an unbearable 140 degrees! Not only do these high temperatures increase the likelihood of skin injuries, but they also can lead to severe dehydration and heat exhaustion (Claudio).

http://www.hss.edu/conditions_artificial-turf-sports-injury-prevention.asp
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2265067/>
<http://toriihunter.mlblogs.com/>
http://www.hss.edu/conditions_artificial-turf-sports-injury-prevention.asp

By Matt Rosenblatt

Health and Environmental Concerns

Although artificial turf has many positives, those being economically and known for easier maintenance and cheap upkeep, it also has many environmental and health concerns as well. Some evidence so far suggests that there are dozens of synthetic rubbers and chemicals that may be harmful to people as they tend to leak right into soil and groundwater or are ingested or inhaled, or when people come in contact with them as they get scraped while playing and engaging on physical activity on the turf. Also, other concerns include certain types of bacteria that can grow on the surface. This is from the excess heat generated by the artificial surface, heat that ranges between 140-160 degrees. Besides the fact that those temperature levels are perfect for growth of bacteria, it also raises concerns for being too hot for physical play of athletes.

<http://www.sej.org/publications/tipsheet/synthetic-turf>

By Daniel Wolf

Public Health Concerns Studies

Some studies have been conducted to determine precisely what types of materials may be harmful. The first study conducted took place in a metal facility in Newark, NJ, by the New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry. These organizations tested a nearby community athletic field for lead contamination. Within the samples taken from the field, high levels of lead showed up in the field dust, but the lead did not come from the scrap metal facility. It was determined that these particles were most likely coming from the Turf athletic fields.

<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00275>



Source: New York Times

By Daniel Wolf

Public Concerns

An article from October 28, 2007 written by the New York times describes parental concerns in a Connecticut town regarding small chopped up rubber particles (seen above) found under the surface of the artificial turf her son was playing on. Her concerns were to her son health because he was coming home with the chopped up rubber in his hair and all over his clothes and of course inhaling certain fumes that may have been given off. The main concern is of the fumes. These fumes are of course the gasoline-oil base that is found in the tires.

http://www.nytimes.com/2007/10/28/nyregion/nyregionspecial2/28turfwe.html?_r=1

By Daniel Wolf

Disposal

Disposal of turf fields is a very interesting topic. It in fact seems that not very many people know what happens to the synthetic field when it reaches its average lifespan of 8 to 10 years. Brad Park, an official on synthetic fields at Rutgers University states that “Currently, from what I have seen/heard going on in the industry, synthetic fields are being disposed-of in landfills.” He claims that landfill charges to have it disposed-of on their property, and contractors work the disposal costs into their bids for tear-out, hauling to the landfill, and disposal. The fact that these fields contain plastic and tires does not currently seem to be an issue. Brad then says that as more of these fields are removed the process could change. “As more of these fields come-out, the idea of sending large quantities of tires and plastic to landfills may meet greater opposition.”

The synthetic field industry like to market their products as being fully recyclable. However, Brad does not know of any of that occurring locally.

Restrictions and Regulations

While there are not many regulations that specify the dumping of artificial Turf Fields Many states follow their regulations regarding the dumping of tires and other similar substances that would be found in synthetic turf.

By Daniel Wolf

Types of Chemicals in Synthetic Turf

Recycled crumb rubber, which is one of the most popular types of artificial turf may contain many chemicals in the categories of metals, semivolatiles, and volatiles. The metals may include arsenic, cadmium, chromium, cobalt, lead, manganese, thallium, zinc. There are two types of semivolatiles, phthalates and polycyclic aromatic hydrocarbons (PAHs). The types of volatiles include acetone, carbon disulfide, chloroform, ethylbenzene, methylene chloride, 4-methyl-2-pentanone, tetrachloroethene, toluene, and xylene. Several different companies produce artificial turf so the chemical composition of each company's product may vary. However, the chemicals named above are some of the popular chemicals used in production of artificial turf for most artificial turf companies. Below is a list of some of the above mentioned chemicals and other common chemicals that reside in artificial turf.

<http://www.albany.edu/ihe/SyntheticTurfChemicals.htm>

Carbon Black

This elemental carbon has the physical appearance of a black, finely divided pellet or powder. It is popularly used in the production of tires, rubber and plastic products, and printing inks. The inhalation of carbon black can cause respiratory discomfort resulting in coughing or wheezing, and skin contact may cause drying of the skin. Lung cancer was not found as a result of exposure to carbon black, but studies have shown that it may cause decreased lung capacity over time. There is no evident environmental concern for carbon black, but it should be noted that carbon black is not biodegradable. This means that when it is disposed of at a waste site, it cannot be naturally broken down or decayed by living organisms like many other types of waste.

http://www.carbon-black.org/what_is.html

Benzothiazole

There is little data on this particular type of chemical, but it is in the form of yellow liquid and has an unpleasant odor. There is no information on how benzothiazole affects the environment, yet it is clear that it can be harmful to people. The chemical is harmful if it is inhaled or swallowed and can irritate one's skin or eyes.

<http://msds.chem.ox.ac.uk/BE/benzothiazole.html>

Butylated Hydroxyanisole

This chemical is often used as a preservative in food. It is suspected that it may be linked to the disruption of the endocrine system or may be a cause of cancer. There is no evidence of this, and the FDA approves the use of this in small doses to preserve food. There have been tests with this chemical on animals, and through these tests it has shown to cause cancer of the forestomach. Humans do not have forestomachs, but the cause of any type of cancer on animals should draw concern for the use of this chemical.

http://healthychild.org/issues/chemical-pop/butylated_hydroxyanisole/

Hexadecane

Hexadecane is a colorless liquid that is considered to be combustible, capable of catching fire. It is not thought to be hazardous but, through tests it has been found to be a severe irritant. There is no evidence on its effect to the environment.

<http://msds.chem.ox.ac.uk/HE/hexadecane.html>

Lead

Many people are familiar with this chemical as it used to be popularly found in household paints. It was then seen as extremely toxic and a potential cause for severe health effects such as behavioral problems, learning disabilities, seizures, and even death. Lead dust is sometimes found on artificial turfs fields, mostly ones that have been present for a long period of time. Lead dust can be inhaled easily and is probably just as harmful to the environment as it is to humans.

<http://www.epa.gov/lead/>

Cadmium

This type of metal is considered extremely toxic. It is mostly found in industrial workplaces, and in the past cadmium has been linked to kidney damage, some types of cancer, and death. There have been cases where this chemical was found on artificial turf.

http://www.ehhi.org/reports/turf/health_effects.shtml

Paradigm Laboratories Study

Paradigm Laboratories in Rochester, New York analyzed several samples of artificial turf containing these chemicals and compared them to the upper-limits of allowable concentrations in the soil at New Jersey and New York hazardous disposal sites. They found that the concentration of many of these chemicals was high. In fact, the concentration of many of these chemicals was so high that they even exceeded the hazardous waste site upper limits. What many people may fail to consider is that these chemicals were only tested and measured individually. When the artificial turf is disposed of at the designated waste sites, the chemicals are combined as a mixture. It is known that several of these chemicals have the ability to cause cancer, mutations, and birth effects, and the mixture of multiple cancer causing chemicals only increases these risks and hazards. Paradigm Laboratories concluded their study by stating, "it is particularly important that protective strategies be developed that consider the total burden of chemicals at a location or in a product". When players play on the artificial turf, they do not come into contact with each individual chemical. They are in contact with the mixture of chemicals, which may be very harmful.

By Matt Rosenblatt

Conclusion

The same concern should be given to the environment in which the artificial turf is disposed of. Just as the potential harmful effects of these chemicals on the human body have not been studied extensively, the effects of these chemicals on the environment needs to be further investigated as well. Presently, there is little evidence that the chemicals in the turf can move into the air, soil, or water after the turf is disposed. There is also little evidence for the contrary, that the presence of these chemicals is completely safe and harmless to people and the environment that they live in. More research must be done on artificial turf to officially conclude whether there are harmful effects to people and the environment or not.

By Daniel Wolf

The Service Project: Flyers

For our project, we decided to create flyers that we would post around local schools at all levels. Since this is a topic that many people are probably not aware of, we wanted to first generate interest in the topic. We found that many schools are unaware of the negative aspects of artificial turf, and our service project raises awareness to these townships and their facilities on this topic. We feel that in order to get people to rally and advocate for an issue, they must be educated on the issue. On our flyers, we included only a few words because we figured that most people would not want to read something for an extended period of time. Our goal was to draw interest from people just by getting them to quickly glance at the flyers. On the flyers we did not say that artificial turf is harmful and that it should not be used for sports fields. It is possible that artificial turf is harmful to people and the environment, so further research needs to be done to find the real answer. See Flyer Below.

<http://www.albany.edu/ihe/SyntheticTurfChemicals.htm>

Editorials

Dear editor,

I am writing you to today to express my opinion on artificial Turf fields. Although they seem to be the savior of sporting facilities around the country, they do have a lot of negative effects, especially when it comes to recycling these products. On average a turf field lasts a lifespan of 8 to 10 years. What is next for them? Well most companies are disposing the worn down turf into landfills. Dumping of this product is poor for the environment and some action should be made to promote recycling of the used product once it exceeds its lifespan.

Dan W.
Rutgers University

To Whom It May Concern,

I want to discuss the topic of artificial turf since it is becoming a popular trend for sports fields all over the world. One of the main reasons for its popularization is that it is much easier to maintain than natural grass. It can be argued that athletes are more prone to injuries due to their shoes getting stuck in the turf. "Turf burn" from skin to turf contact is also another common injury. Despite the higher likeliness of minor injuries on turf, it is less likely for major injuries such as head or neck injuries to occur due to the softer playing surface. These are many of the major issues discussed when the topic of artificial turf playing surfaces arises, but many people neglect the negative effects that artificial turf has on the environment. Every ten years, turf on a playing surface needs to be replaced. Some of the used up turf is recycled and reused, but the unused turf is thrown into landfills. The problem with this is that turf is made with different chemicals, many which may be potentially harmful to humans and the environment. Eight states have no restrictions on placing tires in landfills, meaning they can be disposed of freely in those states. There is little information present about the harmful effects of artificial turf and its effect on the environment. It is quite possible that the disposal of turf is completely safe and harmless, but more research should be done to ensure this. All but eight states must have developed laws against the disposal of turf for some reason that needs to be further investigated.

Thank you for your time,

Matt Rosenblatt

YOU should be Concerned!!!

Artificial Turf Fields may be **harmful** to your health and have **catastrophic** effects on the environment

For more info go to:

<http://www.albany.edu/ihe/SyntheticTurfChemicals.htm>

http://www.ehhi.org/reports/turf/health_effects.shtml