NATIONAL CENTER FOR HEALTH RESEARCH

The Voice For Prevention, Treatment And Policy

July 14, 2022

Dear Mayor Brindle, Superintendent of Schools Gonzales, Dr. Bolton, and Members of the Westfield Town Council and Board of Education:

I am writing to share scientific information about artificial turf and playground surfaces, which I am confident will help you determine what is best for the children and adults in your community.

As President of the National Center for Health Research, I am writing at the request of many of your constituents to share the information we have provided to Members of Congress, state and federal agencies, state and local legislators, parents, and others who want to ensure that our children are not exposed to dangerous chemicals when they play on artificial turf or playgrounds. Our nonprofit think tank is located in Washington, D.C. Our scientists, physicians, and health experts conduct studies and scrutinize research. Our goal is to explain scientific and medical information that can be used to improve policies, programs, services, and products.

We understand that these issues are hotly debated, but some information is more accurate than others. For example, if you look at the maintenance contract for an artificial field, you will see that it needs to be watered regularly to prevent it from becoming dangerously hard and to keep its warranty in place. In other words, grass fields and artificial turf fields both require water, but well-designed grass fields will last much longer and be more cost-effective. Artificial turf fields also need to be tested regularly for their ability to absorb shocks due to impact (a GMax test) to ensure that they have not become dangerous for children and athletes who fall.

In the last few years, scientists have learned more about lead and PFAS in artificial turf, as well as the risks of some of the newer infill materials that are available to replace tire crumb. Tire crumb has well-known risks, containing chemicals that have the potential to increase obesity; contribute to early puberty; cause attention problems such as ADHD; exacerbate asthma; and eventually cause cancer. However, the plastic grass itself has dangerous levels of lead, PFAS, and other toxic chemicals as well. PFAS are of particular concern because they enter the body and the environment as "forever chemicals," which means that they are not metabolized and do not deteriorate, accumulating over the years. Recent research indicates that PFAS can cause liver damage and other serious health problems. Unfortunately, PFAS from artificial turf can get into ground water, streams, etc. and from there into drinking water. In fact, New Jersey has one of the most stringent standards for PFAS in drinking water. Replacing tire waste with silica, zeolite, and other infill materials also has substantial risks. For example, it is well known that "particulate matter" can cause lung problems and eventually cause lung cancer.

Federal agencies such as the EPA and the U.S. Consumer Product Safety Commission have been investigating the safety of these products. Despite claims to the contrary, none have concluded that artificial turf is safe. Although the Trump Administration's EPA stated that there was no conclusive evidence that the levels of chemicals in artificial turf was harmful to children, they explained that

their research was based on assumptions and that they had not conducted or reviewed studies of children exposed to artificial turf.

Lead

As you probably know, the American Academy of Pediatrics states that no level of lead exposure should be considered safe for children, because lead can cause cognitive damage even at low levels. Some children are more vulnerable than others, and that can be difficult or even impossible to predict. Since lead has been found in tire crumb as well as in new synthetic rubber, it is not surprising that numerous artificial turf fields and playground surfaces made with either tire crumb or "virgin" rubber (sometimes called PIP) have been found to contain lead. However, the Centers for Disease Control and Prevention (CDC) also warns that the "plastic grass" made with nylon or some other materials also contains lead. Whether from infill, plastic grass, or rubber playground surfaces, the lead doesn't just stay on the surface. With wear, the materials turn to dust containing lead and other chemicals that is invisible to the eye and is inhaled by children when they play.

Why are chemicals that are banned from children's toys allowed in artificial turf and rubber playground surfaces?

Synthetic rubber and plastic are made with different types of endocrine (hormone) disrupting chemicals (also called EDCs). There is very good evidence regarding these chemicals in tire crumb, based on studies done at Yale and by the California Office of Environmental Health Hazard Assessment (OEHHA).[1] However, rubber playground surfaces contain many of the same dangerous chemicals as tire crumb, since they are very similar materials, all made from petroleum.

A 2018 report by Yale scientists detected 92 chemicals in samples from 6 different artificial turf companies. Unfortunately, the health risks of most of these chemicals had never been studied. However, 20% of the chemicals that had been tested are classified as probable carcinogens and 40% are irritants that can cause asthma or other breathing problems, or can irritate skin or eyes.[2]

There are numerous studies indicating that endocrine-disrupting chemicals (also called hormone-disrupting chemicals) found in rubber and plastic cause serious health problems. Scientists at the National Institute of Environmental Health Sciences (which is part of NIH) have concluded that unlike most other chemicals, hormone-disrupting chemicals can be dangerous at very low levels, and the exposures can also be dangerous when they combine with other exposures in our environment.

That is why the Consumer Product Safety Commission has banned numerous endocrine-disrupting chemicals from toys and products used by children. The products involved, such as pacifiers and teething toys, are banned even though they would result in very short-term exposures compared to artificial turf or playground surfaces.

A report warning about possible harm to people who are exposed to rubber and other hormone disrupting chemicals at work explains that these chemicals "can mimic or block hormones and disrupt the body's normal function, resulting in the potential for numerous health effects. Similar to hormones, endocrine-disrupting chemicals can function at very low doses in a tissue-specific manner and may exert non-traditional dose–response because of the complicated dynamics of hormone receptor occupancy and saturation."[3]

Studies are beginning to demonstrate the contribution of skin exposure to the development of respiratory sensitization and altered pulmonary function. Not only does skin exposure have the potential to contribute to total body burden of a chemical, but also the skin is a highly biologically active organ capable of chemical metabolism and the initiation of a cascade of immunological events, potentially leading to adverse outcomes in other organ systems.

Scientific Evidence of Cancer and Other Systemic Harm

It is essential to distinguish between evidence of harm and evidence of safety. Companies that sell and install artificial turf often claim there is "no evidence children are harmed" or "no evidence that the fields cause cancer." This is often misunderstood as meaning the products are safe or are proven to not cause harm. Neither is true.

It is true that there no clear evidence that an artificial turf field has caused specific children to develop cancer. However, the statement is misleading because it is virtually impossible to prove any chemical exposure causes one specific individual to develop cancer.

As an epidemiologist, I can also tell you that for decades there was no evidence that smoking or Agent Orange caused cancer. It took many years to develop that evidence, and the same will be true for artificial turf.

I have testified about the risks of these materials at the U.S. Consumer Product Safety Commission as well as state legislatures and city councils. I am sorry to say that I have repeatedly seen and heard scientists paid by the turf industry and other turf industry lobbyists say things that are absolutely false. They claim that these products are proven safe (not true) and that federal agencies have stated there are no health risks (also not true).

However, we know that the materials being used in artificial turf and rubber playground surfaces contain carcinogens, and when children are exposed to those carcinogens day after day, week after week, and year after year, they increase the chances of our children developing cancer, either in the next few years or later as adults. That should be adequate reason not to install them in your community. That's why I have spoken out about the risks of artificial turf in my community and on a national level. The question must be asked: if they had all the facts, would your community choose to spend millions of dollars on fields that are less safe than well-designed natural grass fields?

Dangerously Hot and Hard Fields

I grew up in New Jersey and know that when the weather is warm and/or sunny, it is usually quite pleasant to be outside – as long as you aren't on artificial turf or an outdoor rubber surface. Even when the temperature above the grass is 80 degrees Fahrenheit, artificial turf and rubber playground surfaces can reach 150 degrees or higher. A sunny 90 degree day is likely to be even hotter than 160 degrees on these surfaces. These temperatures can cause "heat poisoning" as well as burns.

As I noted briefly above, artificial turf fields can get dangerously hard as well. Turf companies recommend annual tests at 10 locations on each turf field, using something called a Gmax score. A Gmax score over 200 is considered extremely dangerous, and it is considered by industry to pose a death risk. However, the synthetic turf industry and American Society for Testing and Materials (ASTM), suggest scores should be even lower — below 165 to ensure safety comparable to a grass

field. Will your community pay to have these tests conducted annually on your public artificial turf fields?

The hardness of natural grass fields is substantially influenced by rain and other weather; if the field gets hard, rain or watering will make it safe again. In contrast, once an artificial turf field has a Gmax score above 165, it needs to be replaced because while the scores can vary somewhat due to weather, the scores will inevitably get higher because the turf will get harder. Gmax testing involves testing 10 different areas of a playing fields, to make sure all are considered safe. Some officials average those 10 scores to determine safety; however, experts explain that is not appropriate. If a child (or adult) falls, it can be at the hardest part of the field, which is why safety is supposed to be determined by the score of the hardest part of the field.

Environmental Issues

In addition to the health risks to school children and athletes, approximately three tons of infill materials migrate off of each synthetic turf field into the greater environment each year. About 2-5 metric tons of infill must be replaced every year for each field, meaning that tons of the infill have migrated off the field into grass, water, and our homes.[4] The fields also continuously shed microplastics as the plastic blades break down.[5,6] These materials may contain additives such as PAHs, flame retardants, and UV inhibitors, which can be toxic to marine and aquatic life. Microplastics are known to migrate into the oceans, the food chain, and drinking water, and they can absorb and concentrate other toxins from the environment.[7,8,9]

Synthetic surfaces also create heat islands.[10,11] In contrast, organically managed natural grass saves energy by dissipating heat, cooling the air, and reducing energy to cool nearby buildings. Natural grass and soil protect groundwater quality; biodegrade polluting chemicals and bacteria; reduce surface water runoff; abate noise; and reduce glare.[12]

Alternative Infills

Envirofill artificial turf fields are advertised as “cooler” and “safer,” but our research indicates that these fields are still at least 30-50 degrees hotter than natural grass. Envirofill is composed of materials resembling plastic polymer pellets (similar in appearance to tic tacs) with silica inside. Silica is classified as a hazardous material according to OSHA regulations, and the American Academy of Pediatrics specifically recommends avoiding it on playgrounds. The manufacturers and vendors of these products claim that the silica stays inside the plastic coating. However, sunlight and the grinding force from playing on the field breaks down the plastic coating. For that reason, even the product warranty admits that only 70% of the silica will remain encapsulated. The other 30% can be very harmful as children are exposed to it in the air as particulate matter that can harm the lungs.

In addition, the Envirofill pellets and some other infill have been coated with an antibacterial called triclosan. Triclosan is registered as a pesticide with the EPA, and the FDA has banned triclosan from soaps because manufacturers were not able to prove that it is safe for long-term use. Research shows a link to liver and inhalation toxicity and hormone disruption. The manufacturer of Envirofill says that the company no longer uses triclosan, but they provide no scientific evidence that the antibacterial they are now using is any safer than triclosan. Microscopic particles of this synthetic turf infill will be inhaled by children, and visible and invisible particles come off of the field, ending up in shoes, socks, pockets, and hair.

Engineered wood fiber products are a safe material for playground surfaces. Don't be fooled by other wood products, such as BrockFILL, which has been scientifically tested and found to contain PFAS, the "forever chemicals" that I referred to earlier in this letter. In addition, the Brock shock pad also tested positive to PFAS.

In summary, in response to the concerns of educated parents and government officials, numerous new materials are now being used for infill instead of tire crumb and other very controversial materials. However, all the materials being used (such as zeolite, corn husks, Corkonut, and BrockFILL) have raised concerns, and none are proven to be as safe or effective as well-designed grass fields.

Conclusions

There have never been any safety tests required prior to sale that prove that any artificial turf products are safe for children who play on them regularly. In many cases, the materials used are not publicly disclosed, making independent research difficult to conduct. None of these products are proven to be as safe as natural grass in well-constructed fields.

I have cited several relevant scientific articles on artificial turf in this letter, and there are numerous studies and growing evidence of the harm caused by these synthetic materials. I would be happy to provide additional information upon request (dz@center4research.org).

I am not paid to write this statement. I am one of the many parents and scientists who are very concerned about the impact of artificial fields on our children. Your decision about artificial turf and playground surfaces can save lives and improve the health of children in your community. You owe it to your community to make sure that you know the risks of artificial turf and do all you can to protect your children from both the known risks and the suspected risks. Your decisions about artificial turf will be cited by other communities, making it even more important that your decision is based on scientific evidence, not on sales pitches by individuals with conflicts of interest.

Officials in communities all over the country have been misled by artificial turf salespeople. They were erroneously told that these products are safe. On the contrary, there is clear scientific evidence that these materials are harmful. The only question is how much exposure is likely to be harmful to which children? We should not be willing to take such a risk. Our children deserve better.

Sincerely,

Diana Zuckerman, Ph.D.
President

References

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