



Icahn
School of
Medicine at
Mount
Sinai

Children's Environmental Health Center
Department of Preventive Medicine

Icahn School of Medicine at Mount Sinai
One Gustave L. Levy Place, Box 1217
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February 9, 2016

To the members of the Guilford High School Building Committee,

We are writing to urge the Committee to carefully weigh the potential risks of the installation of a crumb rubber infill turf field.

Over the past decade, several hundred artificial turf fields have been installed on the East Coast. Cities, towns and school districts installed these fields to improve the quality of playing fields and accommodate sports programs. Many of these fields contain a material termed "crumb rubber" infill, which is made from ground up car and truck tires. Unfortunately, the potential long-term health consequences of exposures to crumb rubber synthetic turf fields were not carefully assessed by independent third parties prior to their installation throughout the country.

As pediatricians, researchers and scientists at the Children's Environmental Health Center of the Icahn School of Medicine at Mount Sinai School, which hosts one of 10 nationally funded Pediatric Environmental Health Specialty Units, we have received numerous phone calls from concerned parents and physicians regarding the wide scale use of artificial turf fields on school grounds and in parks properties. This led us to conduct a review of the risks and benefits of artificial fields, during which we found **significant gaps in the evidence supporting the safety of crumb rubber turf fields**. Our findings are presented below and in the attached "Artificial Turf: A Health-Based Consumer Guide".

Potential negative health consequences related to artificial turf fields include:

1. **Extreme heat.** On hot summer days, temperatures of over 130 degrees Fahrenheit have been recorded a few feet above the surface of synthetic turf fields – precisely at the altitude where children play. Vigorous play in these conditions conveys a very real risk of heat stress or heat stroke.
2. **Injuries and abrasions.** The evidence on injuries is mixed, but there may be a slightly higher risk of abrasions and contact injuries on synthetic fields.
3. **Inhalation and ingestion of toxic and carcinogenic chemicals.** The major chemical components of crumb rubber are styrene and butadiene, the principal ingredients of the synthetic rubber used for tires in the United States. Styrene is neurotoxic. Butadiene is a proven human carcinogen that has been shown to cause leukemia and lymphoma. The crumb rubber pellets that go into synthetic turf fields also contain lead, cadmium and other metals. Some of these metals are



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included in tires during manufacture, and others picked up by tires as they roll down the nation's streets and highways. Perhaps ironically, if the parent tires from which these fields are made were to be piled onto a public field the area would likely be designated for remediation due to the health risks of the chemicals found in rubber tires. There is a potential for all of these toxins to be inhaled, absorbed through the skin and even swallowed by children who play on synthetic turf fields. **It is our scientific opinion that adequate exposure assessment studies have not been conducted to justify the use crumb rubber surfaces in areas where children play.**

4. Transportation home of crumb rubber pellets. Infill pellets do not remain on the artificial turf fields. These pellets are picked up on children's shoes, clothing and skin. They are then tracked into children's homes and cars, and they are carried into the places where children live, play, eat and sleep. Thus exposure can continue for many hours beyond the time that a child spends in play on the synthetic turf field.

5. Escape of chemical hazards from fields to the environment. A number of the toxic and chemical components of the crumb rubber that is installed in synthetic fields are soluble in water. When rain and snow fall on synthetic fields, these materials can leach from the fields to contaminate ground water and soil. In addition, chemicals in turf can be released into the air and inhaled, particularly on hot days.

6. Disposal. A further unresolved issue is what to do with the toxic components of synthetic turf fields 10 or 20 years from now when the fields reach the end of their usable life-span and need to be dismantled. The costly process of separating, reclaiming, reusing, recycling, or disposing of the various components of a turf field are often overlooked at the time of installation. Will the crumb rubber need to be dealt with as hazardous waste, since it contains toxins and carcinogens? Will it need to be placed in a hazardous waste landfill? What will disposal cost? Who will pay? Often, these questions have not been factored into the overall cost of a crumb rubber turf field.

Alternatives to crumb rubber Newer generations of turf infill have recently become available that are purported to reduce some of the risks of playing on crumb rubber such as exposures to extreme heat and toxic chemicals. These include the synthetic polymers EPDM and TPE as well as "organic" options like cork and coconut fibers. While they may be good alternatives to crumb rubber, to our knowledge, independent long-term safety studies have not been conducted and chemicals of concern may be present (see attached Consumer Guide).

For the reasons outlined above, we recommend that the town of Guilford err on the side of caution by opting not to install an additional crumb rubber turf field. **In the absence of convincing evidence of safety, we recommend that children not play on surfaces that contain known carcinogens and neurotoxins.**



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Thank you for the opportunity to provide you with our professional opinion. We would be more than happy to answer any questions that you might have.

Kind Regards,

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Director, Mount Sinai Children's Environmental Health Center

Sarah Evans, PhD, MPH

Homero Harari, ScD, MSc

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