

Crumb Rubber in Playgrounds and Children's Health

Narrator: Head to any park on a sunny day, and you're sure to hear the familiar sound of children laughing and playing as they whiz down a slide, swing high up in the air, or spin on a merry-go-round. You may also hear children or adults playing soccer, baseball, frisbee, or other sports.

You've probably seen parks or schools that use artificial turf for athletic fields, or use spongy rubbery surfaces for playgrounds. In both cases, small pieces of rubber, called crumb rubber, are used to provide a softer surface for recreation and play. Crumb rubber comes from recycled automobile tires that are ground into small rubber pellets. While crumb rubber may make artificial turf and playgrounds more comfortable to play on, there has been growing concern from communities and scientists about its safety.

Dr. Bob Wright is a professor and researcher in the department of Environmental Medicine and Public Health at the Ichan School of Medicine at Mount Sinai, who's research centers on children's environmental health. He says that his Center has been receiving many questions about the safety of crumb rubber. The primary reason for concern about using crumb rubber in playgrounds and athletic fields, according to Dr. Wright, is that tires from which it is made are known to contain heavy metals, cancer-causing chemicals, and other potentially toxic substances.

Wright: The example I like to give is if you took 1,000 tires and you tossed them onto a field, that field would basically be considered a toxic waste dump. But if you grind them up and sell them as a playground fillant then it seems to be okay, and my concern is that there hasn't been proper testing as to whether or not people are exposed to these chemicals. I think that it's largely unknown and it's that not knowing that is so concerning.

Narrator: Understanding whether or not people are exposed to the chemicals in crumb rubber is an important step in determining if crumb rubber used in playgrounds and artificial turf fields is safe. Because children often play on these surfaces, it is also important to understand how their exposures may be different from adults.

For example, Dr. Wright says that when children touch the material, they may absorb some harmful chemicals through their skin. They may also accidentally eat small particles or breathe in chemicals that are released from the crumb rubber into the air. He notes that children also have unique features and behaviors that may increase their exposure to harmful chemicals.

Wright: Very young children that might play on a playground that has crumb rubber tend to put their hands in their mouth, which is not something that adults do. So if there are small particles, they are more likely to ingest them. Kids are running and exerting themselves, and any time you run and exert yourself you breathe deeper, so you are actually going to inhale more than if you were at rest. Also, because children are smaller, particularly children who are crawling, they are going to get a bigger dose because the off-gassing concentrations are going to be higher near the ground than they are farther up.

Narrator: In addition to having increased risk of exposure to potentially toxic chemicals in crumb rubber, children are also uniquely vulnerable to the harm these chemicals can have on their bodies.

Dr. Wright explains that childhood is an important window of development that can be susceptible to health problems that exposure to chemicals might cause, even if those exposures might not affect adults in the same way.

Narrator: Scientists and medical professionals have expressed concern about the use of crumb rubber in playgrounds and athletic fields because its safety hasn't been tested. Since there are no published studies characterizing human exposure to chemicals in crumb rubber under realistic playing conditions,¹ Dr. Wright emphasizes that this is important and challenging issue for children's health.

Wright: I'm not saying that I know that crumb rubber is toxic, but I'm concerned that we don't know that it is safe, and I think that the goal should be to make sure that playing fields that are being used by children are safe.

Narrator: Given these uncertainties and the unique vulnerabilities of children, scientists like Wright are working to understand how humans are exposed to crumb rubber and to study the safety of the material.

Dr. Homero Harari, an assistant professor in the Department of Environmental Medicine and Public Health at the Ichan School of Medicine at Mount Sinai, is the lead investigator on a study with Dr. Wright that is looking to better understand how people may be exposed to chemicals in crumb rubber.

Harari: Our study is trying to understand the different chemicals that are in crumb rubber, and is also trying to understand how players and users might be exposed to these chemicals. Our project was designed because of the lack of exposure information to different chemicals that are contained in crumb rubber. We want to understand inhalation exposure route as well as dermal route and ingestion. In addition, we are trying to address some concerns from the community in regards to the temperature of these fields, especially during summer or hot days.

Narrator: Dr. Harari says that community partners have played a large role in how his team is studying crumb rubber. By participating in meetings and listening to their concerns, Dr. Harari has been able to design experiments that create realistic exposure scenarios that aim to address the community's concerns.

Harari: Our project is ongoing but, what we have seen is that the material that contains crumb rubber can get really hot. We have found that on a summer day, sunny with an ambient temperature of 80 degrees, while the temperature of a playground with sand can be 93 degrees or the temperature of wood mulch would be 85 degrees, the surface temperature of a playground that contains crumb rubber can be easily over 160 degrees, which is very concerning because it can cause skin burns and because the temperature can drive the off-gassing of many chemicals from crumb rubber and also the adhesives that are used with crumb rubber in playgrounds.

¹ See Mt. Sinai's [Consumer Guide on Artificial Turf](#)

Narrator: Dr. Harari hopes that this ongoing research, as well as other federally-funded research, will help provide information that can be used by schools, parents, and local governments to make informed decisions about the materials that are used in playgrounds and artificial fields.

Harari: We know that there are alternatives for different infills and for playgrounds, but I just want to make a point that any material that is in the market should be tested for safety prior to being introduced, so unless we see the safety testing and we make sure there are not toxicants and contaminants, we should not use them.

Narrator: Dr. Harari says that besides having information about safety testing available, there are other ways parents can protect their children from exposure to potentially toxic chemicals in crumb rubber. Parents, school officials, and community groups could be involved in the decision-making process when new fields or playgrounds are being planned. They could also request safety testing by reaching out to the Department of Public Health in their state.

Dr. Harari also stresses that children should still be encouraged to play outdoors at play grounds and to play sports, but he says that if children are in contact with surfaces that contain crumb rubber they should take a bath after they return home to wash their skin and remove any contaminants that they may have been in contact with.

You can find more information about crumb rubber and the research that is being done to understand the potential health risks on our website at niehs.nih.gov/podcasts.

Thanks to today's guests, Dr. Bob Wright and Dr. Homero Harari for joining us!

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