

Assessing the Impacts of Tire Crumb Exposure
Washington Alliance for Nontoxic Play and Athletic Fields

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While crumb rubber may not appear to be the most dangerous substance on the list, there are a number of reasons to prioritize it. First, it is a complex mixture of known carcinogens, reprotoxins, neurotoxins, endocrine disruptors, respiratory sensitizers. Testing of the complete mixture is the only way to determine the carcinogenicity and short-term toxicity hazards of the compound. As stated by the EPA guidelines, component-based risk assessment methods for complex mixtures are worthless. This is even more so the case with crumb rubber given that there is no government toxicity data on approximately half of the identified components.

Second, tens of millions of fetuses, infants, toddlers, children, teens are being regularly exposed to this mixture, and fetuses, infants, and young children are especially vulnerable to the effects of toxicants. Crumb rubber exposure is not only a potential risk for the soccer player on the field, but also the kindergartener who encounters it on the school playground, and the fetus who is exposed while its mother watches its older sibling play at a neighborhood playground that is surfaced in rubber chips.

Third, many if not most, of the people exposed to crumb rubber have no knowledge or understanding of the potential risks posed by the toxicants in crumb rubber. Therefore, many take no steps to minimize exposure such as showering after using the fields. Others do not have the ability to take precautions. For example, when children use a playground that has crumb rubber chips as the ground covering, they may look like coal miners after recess (as has been reported in many news articles), but have no way to wash more than their hands.

Fourth, although there has yet to be an epidemiological study of the cancers that have been appearing in young soccer and football players, there have been some disturbing patterns. For example, Coach Amy Griffin testified before a Washington State Congressional committee that there have been multiple instances of two or three youths from the same soccer team developing cancer in Washington. While the statistical significance of that is unknown, it is slightly worrying.

Fifth, the uncertainty around the safety of crumb rubber has become an increasingly divisive issue for many communities. Children need safe places to play. Crumb rubber has been marketed as a protective surface for playgrounds and is the key component in almost all artificial turf fields. As scientists have raised concerns about the toxicity of the chemicals in crumb rubber and the possibility that pulverized used tires may not be a safe substance to use around children, some parents have listened. Parental concern about safety is causing debate at local city councils, parks districts, school boards, and other governmental bodies. Often these small agencies commission literature reviews or studies. They hold

study sessions and expert witnesses are paid, often by the affected industries, to come in and testify. Public comments may make meetings last hours past their usual time.

For example, the installation of two new crumb rubber fields in my community created a great deal of institutional disruption. Public comments, expert witness testimony and discussion took up at least 20 hours of time at city council meetings over a six-month period. Board members also put in time away from the public meeting in negotiations, reading emails, and researching the issue. The school board also listened to public comments, had a study session, and commissioned a literature review from an industrial hygienist. However, the school board probably only dedicated about 10 hours of meeting time to the issue. The public health agency providing major funding for the field construction commissioned a study by Gradient. The city council felt that there was not enough evidence of safety to justify using crumb rubber on new fields. The city council wanted to err on the side of caution when it came to kids' health. Since the school board saw no risk, it was unwilling to compromise on the chosen infill for the fields and this created a rift between two governmental entities that had previously gotten along very well.

In Washington State, many field installations generate controversy. In the past year, I have gone to deliver public comments in two local cities. During the same time, residents of two other cities have requested that I come comment, but I was unable to do so because of scheduling conflicts. I am also aware of other local cities that are debating the use of crumb rubber.

It is absolutely ridiculous to have every city, school board, and parks district trying to guess whether it is safe to use crumb rubber in children's play spaces based on wholly inadequate component-based health risk assessments. Government officials have other work to do, and so do all the citizens who show up to debate this issue. Everyone will remain stuck in a seemingly endless debate until definitive studies are performed.

It is very important that the federal government step in and settle the issue. Parents either need definitive evidence that it is safe to use tire crumbs in children's play spaces or they need to know that tire crumb is unsafe so they can take appropriate steps to protect their children.

To settle the debate, the studies must satisfy scientists raising concerns about the safety of crumb rubber. The studies must mimic real world conditions, including special situations like superheated fields, goalkeepers doing functional training, and toddlers intentionally ingesting crumb rubber. The high degree of heterogeneity of crumb rubber and the known presence of chemical hotspots must also be taken into consideration when conducting testing. Ingestion of a handful of crumbs from a hotspot may cause an acute hazard while ingestion of a different handful might be relatively safe.

Ideally, the animal exposures should include simultaneous inhalation, dermal and ingestion exposure. The inhalation exposure must include both the off-gassed chemicals and the fine particulate matter, especially PM 2.5.

Determining the level of particulate matter that should be included in the exposure scenario will be difficult as there are no existing studies that measured PM 10 or PM 2.5 using personal air space monitors during actual or simulated play. The closest is a study by Dr. Stuart Shalat that measured PM 100 and airborne lead levels. This study is noted in my bibliography.

While animal studies will take a few years to complete, if they are started now, we may have a resolution to this ongoing controversy in a few years. If crumb rubber is more toxic than previously thought, at least we will know and will be able to take steps to prevent further harm. It won't be cheap or easy, but the downstream costs of cancer, asthma and other diseases tend to be far more expensive. If it is safe, then we can relax put this controversy behind us.