

# Crumb Rubber in Athletic Fields

## QUESTIONS REGARDING POTENTIAL HEALTH EFFECTS FROM THE USE OF CRUMB RUBBER IN ATHLETIC FIELDS

### What is Crumb Rubber?

Crumb rubber is created by shredding scrap tires or other rubber into small pellets. The steel and other fibers in scrap tires are removed in the manufacturing process.

### How is it used?

Crumb rubber is used in a variety of products including playground and other sports surfacing, and rubber-modified asphalt. Crumb rubber used as a filler in synthetic turf fields helps support the artificial blades of “grass” to give the field a more natural texture and feel.

### Are there health concerns?

Tires contain a number of materials that can be harmful to health, including metals (zinc, lead), volatile organic compounds (methyl isobutyl ketone), semi-volatile organic compounds (benzothiazole, PAHs), and particulates. Users of synthetic turf fields with tire crumb rubber infill can potentially be exposed to these chemicals while breathing, contacting the material with their skin, or by ingesting it. In addition to the potential for chemical exposures, there are also concerns about possible exposure to microbial pathogens in tire crumb and on synthetic turf fields, such as methicillin-resistant *Staphylococcus aureus* (MRSA).<sup>1</sup> The majority of studies conducted to-date have concluded that there is no elevated health risk associated with exposure to chemicals in tire crumb infill.<sup>2</sup> However, these studies have not comprehensively addressed all potential health risks associated with exposure to tire crumb.

### What is being done?

Research across international and U.S. government agencies and academic institutions has sought to characterize chemicals found in tire crumb and potential exposures to those who use turf fields. Active research is underway by the California Office of Health Hazard Assessment, which is planning to release a comprehensive study of potential health risks in 2019.<sup>3</sup> At the federal level, a multi-agency research project was initiated in 2016 as a result of growing public concern over chemicals in recycled rubber.<sup>2</sup> As of August 2019, the first of several planned reports has been released.<sup>1</sup> This report measured chemicals and bacteria in tire crumb rubber at indoor and outdoor fields. The report finds that while chemicals of concern are present in tire crumb rubber, human exposure may be limited based on what is released into air or into simulated biological fluids. The Minnesota Department of Health is tracking these research efforts and will consider the results in any future recommendations regarding the use of crumb rubber in synthetic turf fields.

## Are there other considerations?

During warm, sunny days, synthetic turf fields can become hot, increasing the risk of heat-related stress.<sup>4</sup> Established guidelines should be followed to prevent heat illness and injury in child and adult athletes. Research on athletic injury risk from synthetic fields versus natural grass fields has shown mixed results.<sup>5</sup> Crumb rubber infill thickness can be reduced over time, which can result in higher risk of injury due to increased surface hardness.<sup>6</sup> Proper upkeep and maintenance of the field surface is important for preventing injury, regardless of whether it is a synthetic or natural grass field.

## Are there health benefits?

Synthetic turf can be used more often and longer than traditional grass fields, increasing opportunities for physical activity for students and community residents. Regular physical activity reduces the risk of many chronic diseases, including cardiovascular disease, diabetes and some cancers, and can improve mental health.<sup>7</sup> The availability of community sports facilities can also help reduce health disparities in underserved areas by helping to create environmental, economic, and social conditions that promote health.<sup>8</sup> Crumb rubber infill diverts used tires from landfills which can provide community health benefit by removing mosquito breeding grounds and reducing fire hazards from tire piles.

## Are there other benefits?

Compared to natural grass fields, synthetic fields conserve water by eliminating the need to irrigate and do not require use of pesticides and fertilizers. However, there has been limited study of environmental impacts from crumb rubber infill. Some studies have found that zinc in leachate and stormwater runoff from artificial turf sites is a concern for surface water quality and aquatic organisms.<sup>9</sup>

## Now what?

Based on current evidence, there is no reason to advise people against playing sports on synthetic turf fields. Comprehensive studies are currently underway to fill scientific data gaps in our understanding of potential health risks from crumb rubber in athletic fields. MDH will continue to gather information and track ongoing studies. In the meantime, users of these fields can take some simple precautions such as:

- Washing with soap and water after use, especially any scrapes or cuts
- Shaking out clothes/shoes to limit take home of rubber crumbs
- Cover food/beverages to prevent contamination with rubber material and avoid eating while on the field

## References

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08/16/19

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