

Update: Crumb Rubber Turf Fields

Radnor Township Board of Health

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Last considered by the BOH in February 2016

PROBLEM:

- Synthetic turf/artificial turf is often composed of “crumb rubber”
- “Crumb rubber” consists, mainly, of recycled tires
- Tires contain a host of hazardous chemicals and heavy metals
 - SVOC
 - VOC
 - PAH
 - Lead, Zinc, Chromium, etc.
- Paint is often a lead chromate base
- Players exposed to compounds through dermal, respiratory, digestive pathways

At that time, EPA and CDC were undertaking a study

Literature review update:

- Limited research since Spring 2016 within PubMed
- Peterson, Lemay, Shubin & Prueitt (2017) reported on a meta-analysis of chemical composition of recycled rubber and air quality on or near turf fields. Estimated non-cancer and cancer risks were within EPA guidelines; cancer risks for synthetic turf fields comparable or lower than natural soil fields.

Connecticut Department of Public Health (2016):

- Connecticut Department of Public Health notes that while a number of studies do not indicate elevated risk, there is still uncertainty.
- The advantage of artificial turf is that athletes are not exposed to pesticides.
- Exposure to polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) is due to:
 - Incidentally ingesting small amounts
 - Breathing in small particles or vapors
 - Direct skin contact

New York State Department of Health (2017)

- Additional concerns:
 - Heat stress – athletes must be well hydrated and seek relief in shade
 - There is no pattern regarding risk of injury by type of turf though abrasions seem to be increased on synthetic turf
 - Infection risk has not been studied systematically and no definitive statements can be made
 - Latex allergy has not been associated with artificial turf

NY State, continued

- Their conclusions:
- The California EPA and Norwegian Institute of Public Health have both found low risk to children from ingestion of crumb rubber
- The French National Institute for Industrial Environment and Risks finds that inhaled vapors do not contribute to health risk
- The CDC and Agency for Toxic Substances and Disease Registry acknowledge the potential for lead exposure and recommend products that do not have elevated lead levels
- In summary, the New York State Department of Health believes that synthetic turf does not pose a health risk

US DHHS National Toxicology Program (2017)

- Has received requests from private citizens as well as the State of California and the European Chemicals Agency to conduct in vivo and in vitro toxicology studies
- Aimed to complete this work by the end of 2017
- Goal was to conduct short-term in vivo and in vitro toxicology studies on crumb rubber
 - Animal and cell models similar to human experience
 - Emphasis on blood and brain cancer
 - Consideration of nasal and whole-body inhalation, mixing into feed, construction of housing and furniture (e.g. bedding) with crumb rubber
 - Study will assess organ pathology, genotoxicity, and gene expression analysis

NTP, continued

- Cell cultures with various exposures
- Comparison of new and aged turf
- Partnership with other federal agencies and academic researchers
- Intention to pool samples and share data with other researchers
- Results pending

US EPA (2017) updates:

- US Consumer Product Safety Commission has initiated a playground study, in progress
- The federal study was approved by the Office of Management and Budget in August 2017
- Crumb samples have been gathered from manufacturers and indoor and outdoor fields across the United States
- EPA is aware of alternative products – sand, coconut husks, cork, shredded mulch; EPA has not evaluated these materials

EPA (2017) recommendations:

- Avoid mouth contact with playground surface materials
- Avoid eating or drinking while directly on the playground
- Wash hands before handling food
- Limit time on a playground on extremely hot days
- Clean hands / skin after visiting the playground
- Consider changing clothes after play on the playground
- Clean toys that were used on the playground after the visit

Toxics Use Reduction Institute (2017)

- Based at the University of Massachusetts at Lowell
- A leader in research regarding artificial turf
- Strongly recommends organically grown natural turf
- Provides resources on other synthetic turfs that may be less toxic than recycled tires, but data are incomplete
- https://www.turi.org/Our_Work/Home_Community/Artificial_Turf

Cornell University: Sports Field Management (2017). Investing in Safe Fields.

To provide a safe natural turf field:

- Make sure field has thick turf cover (no bare spots)
- Field surface hardness is associated with athletic injuries – turf should provide cushion
- Avoid pesticides
- Alternate use of synthetic turf fields allows for “rest and recuperation” of natural fields

References

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