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## **Artificial Turf: Analysis of the 2010 Study**

Because the synthetic turf industry has claimed that the CT Department of Health study shows that synthetic turf fields were safe, Environment and Human Health, Inc., felt it important to closely analyze the actual study to see what it really said. The study only looked at the health risks to those 12 years and up

— yet many younger children also play on these fields. On careful reading you will see the flaws in the study and all their stated limitations. It is hard to believe that the researchers could declare that their data showed the fields were safe.

## THE CONNECTICUT STUDY OF 2010

[Human Health Risk Assessment of Artificial Turf Fields Based Upon Results from Five Fields in Connecticut \(link\).](#)

### AUTHORS:

Gary Ginsberg and Brian Toal Connecticut Department of Public Health, Program in Environmental and Occupational Health Assessment, Hartford, CT

### DATE:

July 2010

**This study was peer reviewed but not published and includes a short literature review, a toxicity profile on a rubber-related chemical, benzothiazole (BZT), and original research in the form of a human health risk assessment.**

The objective of this human health risk assessment (HHRA) was to estimate exposures and risks for children — twelve and older — playing on artificial turf fields with crumb rubber infill.

In July 2009, Connecticut field researchers collected air samples from five artificial turf fields. They sampled four outdoor fields and one indoor field. In 2010, Connecticut researchers took this data and analyzed the personal air and stationary air samples to determine their acute or chronic, cancerous or non-cancerous health effects in school-aged children and adults.

Results were analyzed for multiple volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and targeted rubber-related and miscellaneous semi-volatile organic compounds (SVOCs).

**The researchers identified twenty-seven chemicals of potential concern in the air samples they reviewed. Non-cancer risks were assessed for all of these chemicals. Cancer risks were assessed for thirteen chemicals. Acute health risks were developed for fifteen chemicals. They calculated cancer and non-cancer risks for acute and chronic exposures to these chemicals in four possible scenarios — children playing on indoor fields, children playing on outdoor fields, adults playing on indoor fields, and adults playing on outdoor fields.**

The researchers clearly found the presence of Benzothiazole (BZT) to be field-related. They expressed uncertainty as to whether several PAHs and VOCS may be field-related.

**Their conclusion was that cancer risks in all scenarios were slightly above de minimis (negligible) but were higher for children than for adults.** They determined there was little concern for chronic, non-cancer risk despite their uncertainty about significantly (two-fold) elevated exposure risks at the indoor field as compared to the outdoor fields, due to air-borne, off-gassed chemicals. They advised adequate ventilation for indoor fields, that outdoor fields should be installed during cooler months, and that any dermal or respiratory allergic reactions experienced on the fields may be a result of the fields and should be reported to physicians and the local health department.

(1) The assessment found that two VOCs, benzene and methylene chloride, were the greatest contributors to cancer risk in each scenario with additional small contributions by chloromethane, BZT and PAHs. Some doubt was cast upon the presence of benzene and methylene chloride as contributors because they were found only in the air samples collected in personal air monitors. The researchers hypothesized the chemicals were a result of the equipment itself or were exuded by the people wearing the personal air monitors.

(2) BZT, a rubber-related chemical, was the only targeted SVOC detected above background levels on both the indoor and outdoor fields. The results for the indoor field were 11.7 times greater than the outdoor results.

### (3) Limitations:

- The study was narrowed to investigate only inhalation exposures to athletes who play on outdoor and indoor artificial turf fields. Dermal and ingestion exposure routes were not considered. Since BZT may be available for skin contact in the crumb rubber infill and rubber dust, the researchers suggested it could cause skin irritations to players on the fields.
- Air samples were collected in warm weather, not on hot summer days when VOCs may off-gas in greater amounts from the crumb rubber infill.
- The study had a small sample size. Samples were only collected from four outdoor fields and one indoor field.
- The study's sampling plan was not fully implemented due to technical difficulties with equipment and environmental conditions. In the case of one field, pesticide spraying took place adjacent to the field on the day samples were collected. On other fields, field air samples were not collected at all heights as planned.
- Play on the indoor field was for less than twenty five minutes - a much shorter period of time than was called for in the plan. Despite this fact, chemical levels in air samples from this field were the highest collected in the investigation. There was no ventilation on the day samples were collected at this field. No attempt was made to collect more samples when the field was ventilated and during a longer play time. The flawed data was included in the assessment.
- On all fields sampled there were only two people wearing personal air monitors and two other people on the field. Sampling ranged from less than twenty-five minutes to two hours. This simulation did not reflect real play conditions on a synthetic turf field—it is typical for twenty-two athletes to play for about two hours.
- The exposure scenario was formulated to assess risk to children average age twelve to adult. Children ages birth to three were not included in this assessment. Therefore, exposure risks remain unknown for infants and toddlers who are present on the sidelines while their siblings practice and play on artificial turf fields.
- The report recommended that all indoor synthetic turf fields be adequately ventilated. They also recommended that dermal or respiratory allergic reactions suffered on the fields should be reported to physicians and local health departments.

### Conclusion

**Despite all the limitations, exclusions, and flawed data, the researchers concluded that all cancer risks were negligible, even though the study noted that cancer risks were found to be slightly higher for children ages twelve and older. The study identified twenty-seven chemicals of potential concern, including thirteen carcinogens — yet they declared the risks were negligible. The study found elevated levels of the chemical BZT which is a serious irritant, yet they declared the fields did not pose any health risk to children. How is this possible?**

**This study has been touted by industry as proving the synthetic turf fields are safe. This was a flawed study from the beginning and in no way shows the fields are safe. The study raises more questions than it answers.**

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