

including artificial turf, and development of ADHD (9). Chemicals in the turf with potential carcinogenic activities are also well known (2).

Various *in vitro* tests, or test tube studies, support the hypothesis that chemicals in crumb rubber are endocrine disrupters and carcinogenic (10-13). Importantly, follow-up tests using *in vivo* experiments, studies conducted in animals, have not been described even though *in vivo* models to test for endocrine disrupters and carcinogenic activity are known (14-17). Animal models to assess endocrine disruption are beginning to elucidate biochemical mechanisms by which chemicals with *in vitro* endocrine disruption activity could affect *in vivo* responses (18).

Ominously it was recently reported that embryonic chicks exposed to a water extract of crumb rubber developed brain and cardiovascular abnormalities (19). The study testing crumb rubber water extracts in chicks is important because it is the first to show deleterious effects by water soluble chemicals from crumb rubber in a higher vertebrate. The chemicals in the extract need to be identified. This study is relevant to field exposure to crumb rubber because once the particles are internalized, the chemicals will be in a water-based environment in tissues such as the lung or intestine (20, 21). The human body is approximately 80% water.

At the September 20th town meeting held to discuss the Edison Field Project, the Town stated that “there has been no definitive evidence that links playing on turf fields to long term health complications such as cancer” (22). Although the Town’s statement is technically correct, it cannot be concluded that it is safe for children to play on artificial turf fields. There are too many questions unanswered and research studies are in progress. In the meantime, it is probably prudent for children to avoid exposure to crumb rubber. An example of a similar situation in which scientific evidence is incomplete is the recommendation to avoid exposure to bisphenol A (BPA), an endocrine disrupter (23). The public has been advised to avoid consuming BPA by using BPA-free water bottles and avoid cooking food in plastic containers. A second example is the recent acknowledgement by the EPA that per- and poly-fluoroalkyl substances (PFAS), chemicals found in artificial turf blades and backing, are a public health and environmental hazard (24, 25). Contamination of the nation’s water supply is the primary concern. PFAS are endocrine disrupters. In October 2021 the EPA published a “roadmap” to address concerns of PFAS through “research, restriction, and remediation” (24).

The long-term health of our children is potentially at risk if children are repeatedly exposed to artificial turf. This report recommends that if athletic fields are to be built behind Edison Intermediate School, the fields should be natural grass rather than artificial turf. Once the artificial turf fields are built it will be expensive and a long process to remove those fields and replace them with natural grass if results of future research clearly show the public health dangers of artificial turf to our children.

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