



School Pesticide Monitor

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Boys May Be More Vulnerable to Pesticide Than Girls

Researchers at the Columbia Center for Children's Environmental Health at the Mailman School of Public Health found that, by the age of seven, boys have a greater difficulty with working memory, a key component of IQ, than girls with similar exposures to the insecticide chlorpyrifos. This is the first study to find a difference between how boys and girls respond to prenatal exposure to the chemical.

The study, led by Megan Horton,

PhD, explores the impact of sex differences and the home environment on these health outcomes. Dr. Horton and colleagues looked at a subset of 335 mother-child pairs enrolled in an ongoing inner-city study of environmental exposures, including measures of prenatal chlorpyrifos in umbilical cord blood.

When the children reached age three, the researchers measured the home environment using two main categories: 1) environmental stimulation, defined as the avail-

ability of intellectually stimulating materials in the home and the mother's encouragement of learning; and 2) parental nurturance, defined as attentiveness, displays of physical affection, encouragement of delayed gratification, limit setting, and the ability of the mother to control her negative reactions.

At the age of seven, the researchers tested IQ. While home environment and sex had no moderating effect on IQ deficits related to chlorpyrifos
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School District Violates State IPM Law

Officials have recently discovered that the Northampton School district in Massachusetts has been applying an herbicide on the school grounds that is not listed on any of the schools' integrated pest management (IPM) plans.

The herbicide Lesco (active ingredient glyphosate) has been typically applied once during the summer at each school, and was applied up to five times at one of the schools. When questioned, Northampton's director of custodial services, Michael Diemand, said that since the product, Lesco Prosecutor, can be

bought by anyone at stores, it did not need to be on the plans; however this is not what the law states.

Under a 2000 state Act Protecting Children and Families from Harmful Pesticides, schools and child care centers are required to submit plans detailing the pest problem that exists at their facilities, the pesticides that they plan to apply, and who will apply the pesticides – even if they are not planning to use pesticides at the current time. The law also requires them to notify parents and employees at least two days before any pesticides are applied at these facilities. Pesticide use is pro-

hibited when children are present. Outdoor pesticides that are known, likely or probable carcinogens, contain a "List I" inert ingredients, or are for aesthetic reasons alone are also prohibited from use.

Although the law was passed 12 years ago, inspectors have yet to visit every school in the state. It is not known how many schools are still to be checked, but according to Mr. Diemand, pesticide inspectors have not yet looked into Northampton schools. Back in 2007, state auditors found that many of the schools throughout the state
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Boys

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exposure, the researchers uncovered two intriguing findings related to sex differences, albeit of borderline statistical strength: first, that chlorpyrifos exposure had a greater adverse cognitive impact in boys as compared to girls, lowering working memory scores by an average of three points more in boys than girls (96.5 vs. 99.8); and second, that parental nurturing was associated with better working memory, particularly in boys.

“There’s something about boys that makes them a little more susceptible to both bad exposures and good exposures,” says Dr. Horton. “One possible explanation for the greater sensitivity to chlorpyrifos is that the insecticide acts as an endocrine disruptor to suppress sex-specific hormones. In a study of rats,

exposure to the chemical reduced testosterone, which plays a critical role in the development of the male brain.”

Going forward, Dr. Horton will look at how sex and the home environment may influence the effects of prenatal exposure to other environmental toxicants, such as those found in air pollution. “I expect this information will be useful in efforts to develop new interventions to protect children from the potentially negative consequences of early exposure to harmful chemicals,” says Dr. Horton.

The insecticide chlorpyrifos was widely used in homes until 2001 when the U.S. Environmental Protection Agency restricted indoor residential use, permitting continued commercial and agricultural applications. Since that time, there

has been a drop in residential levels of chlorpyrifos. However, it continues to be present in the environment through its widespread use in agriculture (food and feed crops), wood treatments, and public spaces such as golf courses, some parks, and highway medians. People near these sources can be exposed by inhaling the chemical, which drifts on the wind.

Low-level exposure can also occur by eating fruits and vegetables that have been sprayed with chlorpyrifos. The best way for consumers to reduce the impact that these chemicals have on our health and the environment is to choose organic foods.

Results of this study are published online in the journal *Neurotoxicology and Teratology*, and are available at <http://bit.ly/R2NR5a>.

Congressman

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of Massachusetts were not in compliance with the state law. A corrective action plan to address the problem was supposed to take effect in September 2008 to ensure that children in childcare settings are properly protected against pesticides. However, the plan did not address the need for compliance by public and private schools.

The active ingredient in Lesco is glyphosate, a general herbicide used for eradication of broadleaf weeds. It has been linked to a number of serious human health effects, including increased cancer risk and neurotoxicity as well as eye, skin, and respiratory irritation.

In 2009, Beyond Pesticides, submitted comments to the U.S. Environment Protection Agency (EPA) showing new and emerging science which illustrates that glyphosate and its formulated products pose unreasonable risk to human and environmental health, and as such should not be considered eligible for continued registration.

Some of the most widespread uses of glyphosate that have been attracting public attention include its use in invasive weed management and home gardening. The increased use in these areas is directly tied to the larger problem of poor land management, including over grazing, over development, soil compaction and other stressors.

Glyphosate has replaced ecologically sound and sustainable cultural practices such as green-mulching and preventive maintenance such as aeration and dethatching.

According to the *Daily Hampshire Gazette*, Northampton is the only school district in Hampshire County that has pesticides listed on all of its IPM plans. Most other school districts have adopted no-pesticide policies, but there are a few schools in the county that do allow the use of toxic pesticides in an emergency, including for wasp nests or poison ivy. Those school districts include: Berkshire Trail Elementary School in Cummington, Belchertown High School, Hopkins Academy in Hadley and South Hadley High School.