

## What Role Do Toxic Chemicals Play in Child Development?

A child's developing brain, body, metabolism, and behavior make them uniquely vulnerable to harm from toxic chemicals.

- Exposure begins in the womb through the mother's exposures to toxic chemicals. Infants ingest chemicals through breast milk, formula and contact with their environment.
- Rapid brain development in the fetus, infants and young children make them more susceptible to harm from chemicals that may impair brain function and development.
- For their weight, children eat, drink and breathe more than adults - so pound for pound they take in a greater quantity of toxic contaminants. A small exposure translates into a big dose.
- Children put things in their mouths and spend a lot of time on the floor and ground, so they may ingest chemicals from toys, containers, dirt and dust on a regular basis.

Alcohol and nicotine are the most well-known and preventable causes of behavioral, learning, and developmental disabilities.

It is especially important for pregnant women and women considering pregnancy to take precautions to minimize toxic exposures.

Source: [healthychildrenproject.org](http://healthychildrenproject.org)

## Where Can I Get More Information?

**LDA of Michigan's Healthy Children Project**  
(517) 485-8160  
[www.ldaofmichigan.org/healthychild.htm](http://www.ldaofmichigan.org/healthychild.htm)

**LDA of America**  
(412) 341-1515  
[www.ldaamerica.org](http://www.ldaamerica.org)

**Michigan Network for Children's Environmental Health (MNCEH)**  
(734) 761-3186  
[www.mnceh.org](http://www.mnceh.org)  
[www.healthystuff.org](http://www.healthystuff.org)

**The Collaborative on Health and the Environment (CHE)**  
<http://www.healthandenvironment.org/>

**National Healthy Children Project**  
(888) 300-6710  
[www.healthychildrenproject.org](http://www.healthychildrenproject.org)

The Learning Disabilities Association (LDA) of Michigan's Healthy Children Project (HCP) is here to bridge the gap between our knowledge of environmental factors that can impact the development of fetuses, the newborn, or young children and the actions we need to take in order to minimize or eliminate those factors. To learn more about children's environmental health or subscribe to our monthly e-newsletter, visit [www.ldaofmichigan.org](http://www.ldaofmichigan.org) or call (888) 597-7809 today!

**Healthy Children Project (HCP)**  
**Learning Disabilities Association (LDA) of Michigan**  
200 Museum Drive, Ste. 101  
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# Learning and Developmental Disabilities and Toxic Chemical Exposure

## What's the Connection?

*"Scientific evidence implicates environmental exposures as discernable contributors to adverse health outcomes, such as cancer, neurodegenerative diseases, reproductive health problems, and learning and developmental disabilities." - The Mind, Disrupted Biomonitoring Project*

Funded By: The Michigan Network for Children's Environmental Health, The Institute for Children's Environmental Health, The Learning Disabilities Association of America, and The Healthy Children Project.

## Which Chemicals Should I Be Most Concerned About?

While there are an estimated 80,000 chemical compounds registered for use in the U.S., only a very small fraction have been tested for potential toxic effects. Of those chemicals, the following have been conclusively shown to affect the developing nervous system and cause a wide range of learning and developmental disabilities:

- Alcohol—In a developing fetus, exposure to alcohol, even in small amounts, may have an adverse effect on brain development and function, leading to life-long behavioral and learning disabilities, such as Fetal Alcohol Spectrum Disorders (FASD).
- Lead—Research indicates that there is no safe level of lead exposure for children. Exposure to lead can affect learning and memory and is associated with Attention Deficit Disorders (ADD).
- Mercury—There is no doubt that mercury causes learning and developmental disorders. We are all exposed to some form of mercury; the controversy surrounds the level of exposure at which damage can occur.
- Polychlorinated Biphenyls (PCBs) - These chemicals, although banned in the 1970's, are persistent in our environment. As a result, contamination continues through the food supply and through the mother via breast milk. Numerous studies show that PCBs can adversely affect motor skills, learning and memory.
- Polybrominated Diphenyl Ethers (PBDEs) - These compounds are used as flame retardants in many common products, such as building materials, electronics and home furnishings. Recent studies show that they can lead to changes in motor activity and reduced learning and memory.
- Manganese—Although small amounts of this element is necessary for growth and development, over-exposure can damage the developing nervous system.
- Arsenic—Studies have found a relationship between arsenic exposure and intellectual impairment, while it is commonly found in drinking water around the world.
- Solvents—Recent reports indicate that prenatal exposure to this large group of compounds can result in visual deficits, low birth weight, smaller head circumference, and developmental delays.
- Polycyclic Aromatic Hydrocarbons (PAHs) - These air pollutants are commonly generated through motor vehicles, coal-fired power plants, etc. Studies have linked lower birth weight and cognitive development issues to elevated exposure.
- Pesticides—Commonly used in residential and agricultural settings, acute exposure can lead to developmental disorders, poor motor performance, and other conditions.
- Nicotine and Environmental Tobacco/Cigarette Smoke—Both prenatal and environmental exposure (second hand smoke) can lead to behavioral disorders and neurobehavioral effects in children.

## How Can We Protect Our Children From Toxic Chemicals?

There are many ways that we can eliminate or lessen the exposure of our children to toxic chemicals. You can make a difference by:

- keeping children away from alcohol and cigarette smoke.
- avoiding alcohol if you are pregnant or trying to conceive.
- looking for toys that don't contain lead and other harmful materials (see [www.healthystuff.org](http://www.healthystuff.org)).
- using products that are PBDE-free\* (see [www.healthystuff.org](http://www.healthystuff.org)).
- storing chemicals and solvents (such as paint thinners) out of the reach of children.
- keeping kids away from areas being treated with chemicals and/or pesticides.
- using water and air filters to minimize exposure to lead, mercury, and other contaminants.
- using the fish guide to determine safe levels of consumption (see [www.michigan.gov/fishandgameadvisory](http://www.michigan.gov/fishandgameadvisory)).

To learn more about limiting exposure and how toxic chemicals can affect your family, visit [www.minddisrupted.org](http://www.minddisrupted.org) (see "Mind, Disrupted" report) and [www.iceh.org](http://www.iceh.org) (see "Consensus Statement on Environmental Agents Associated with Neurodevelopmental Disorders"). We would like to recognize the group behind "Mind, Disrupted" and the Collaborative on Health and the Environment's Learning and Developmental Disabilities Initiative for their amazing, detailed reports. Their work provided the framework and knowledgebase for this brochure.