



Environmental threats to Brain Development

What's gotten into us?

The human brain is so complex that it takes at least 20 years to complete growth to maturity, but the first few years are by far the most critical for healthy development. Scientists have long known that low levels of exposure to toxic chemicals and other environmental factors affecting the mother, lead to modest impacts on brain development in a fetus and a growing child. However, recent studies reveal so many children are affected that the harm to our society is anything but modest.

How common are harmful exposures?

In a recent study of 25 million children in the U.S., millions of children tested at lower than expected IQ. Evidence is accumulating that part of the cause is exposure to lead and certain

pesticides and other common chemicals, as well as an increase in pre-term births associated



with exposure to those substances. These exposures are also increasingly associated with increases in autism, attention and memory problems, and other serious learning difficulties. Studies of umbilical cord blood after birth have found hundreds of chemicals present in the pre-natal fluid of expectant mothers. Emotional factors such as stress and the mother's physical environmental factors are both crucial for forming healthy brains. We are all exposed to harmful factors; the still-unanswered question is, how many, how severe the effects and how do they interact?

Environmental factors

Cause	Source(s) of Exposure	Adverse Health Effects
Mercury	Fish; emissions from coal-powered electric plants	Neuro-developmental disorders; loss of IQ; behavioral disorders; lower overall function; visual & hearing impairment
Lead	Paint (in houses built pre-1978) contaminated soil	Neuro-developmental disorders; loss of IQ; behavioral disorders; lower overall function; visual & hearing impairment
Pesticides	Food residues; agricultural settings; in-home use; water contamination	Neuro-developmental disorders; loss of IQ; autism, attention problems, Parkinson's disease in adults
PCBs (banned substance)	Certain fish; industrial workplaces	Neuro-developmental disorders; loss of IQ; behavioral disorders
BPA	Canned food; hard plastics dental sealants; thermal paper	Neuro-developmental disorders; behavioral disorders: immune system disorders: obesity, cardiovascular disease in adults
Phthalates	Plastics; cosmetics; cleaning products; many other everyday products which are colored or fragranced	Behavioral disorders, insulin resistance, obesity, genital malformations in male infants,
Chemicals (over 4,000) in cigarette smoke	Cigarettes; second-hand smoke	Learning and behavioral disorders; loss of IQ; increased risk of preterm labor
Chronic Stress and little exercise	Domestic upheaval & disputes; community violence	Cognitive organization, attention span

Preventative measures

Government oversight for toxics is so inadequate that avoiding chemical exposure requires personal awareness. Washing pesticide-laden produce, using low-VOC paints in your home, limiting intake of certain seafood (high in mercury or other heavy metals), avoiding contact with lead-based paint in our homes and consumer goods, reading labels of household cleaners to determine if they contain chemicals of high concern, and being aware of workplace exposure are all key.



We must also do everything we can to keep our children and expectant mothers healthy. Ensuring access to: high quality and affordable prenatal and postnatal care, affordable and healthy fruits and vegetables-free of pesticides, safe environments where children and families can be physically active, and affordable social and mental health services are all excellent strategies for developing healthy brains.

What else can we do?

While reducing exposure today is possible for some, with conscious effort, time and money, eliminating exposure entirely is not possible. Levels of some banned toxic chemicals are slowly decreasing in our population, but some newer ones are on the rise and there are still measureable amounts of old toxicants which are stored permanently in our body fat. We don't know how most of these exposures interact-- do they add to each other or does their interaction change or multiply their effects?

There are 3,000 chemicals produced or imported at over one million pounds per year, only 43% have received any study at all and only 23% have been examined for potential to cause damage to the brain development of children. We need cost-effective and efficient methods for preventing use of and removing toxics from our environment. We need to encourage industry to develop adequate testing of new and current chemicals.

We need to test new and current chemicals for all kinds of toxicity including neurodevelopmental, and we need to inform more parents of factors that can alter brain development in their children. We need to push policy makers to overhaul the Toxic Substances Control Act to protect the public's health by removing harmful chemicals from the marketplace.

Go to <http://tinyurl.com/PSR-Toxics> to find out more about toxic chemicals and the campaign to reform U.S. laws to protect the health of all communities.

Get involved! Anyone can become a member of Physicians for Social Responsibility. If you share our goal of protecting our health from the threat of toxic chemicals, please join today! Visit us at www.PSR.org



Selected References

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