

*Scientific Studies*

# Childhood Pesticide Exposure Leads to Functional Developmental Disorders

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Organophosphate pesticides may lead to functional developmental abnormalities in the nation's children!

Organophosphates inhibit acetylcholinesterase by binding with cholinesterase at the neuromuscular junction. Lack of acetylcholinesterase is the result of organophosphate overexposure and organophosphate poisoning, which leads to chronic irreversible illness.

Illness induced by chronic organophosphate exposure includes symptoms of nausea, vomiting, headache, blurred vision, dizziness, abdominal pain, and chest pain. Acute exposure results in gastrointestinal upset, bronchospasm, sweating, muscle weakness, depression of the central nervous system, and other symptoms. Irreversible sensory-motor neuropathy can progress into paralysis, ataxia, and spasticity.

More than 13,000 cases of organophosphate poisoning were reported in the United States in 1999, including 83 fatalities.

Scientists at the Center for Research on Occupational and Environmental Toxicology, Oregon Health & Science University have now shown that organophosphates have an additional negative effect on infants whose nervous systems are not fully developed.

Organophosphates impact the normal growth of axons, nerve fiber that extend from brain neurons, interfering with brain growth and development.

The researchers feel this discovery explains why children and animals that have been developmentally exposed to organophosphates may have functional developmental abnormalities.

In addition, developmental exposure to organophosphates appears to increase the vulnerability of the central nervous system to organophosphate pesticides.

Organophosphates include pesticides such as diazinon and chlorpyrifos. Organophosphates are nerve agents first discovered in 1938 and introduced as a chemical warfare agent during World War II. Organophosphates are now primarily used against fleas, lice, flies, and mosquito's.

Infants have been shown to be especially susceptible to environmental contaminants in what is referred to by scientists as the critical stage. Now there is evidence that developmental abnormalities may result from organophosphate exposure.

## References:

Jaga, K, Dharmani, C. Sources of exposure to and public health implications of organophosphate pesticides. *J Public Health*. 2003;14(3).

Yang D, Howard A, Bruun D, Ajuja-Alemanj M, Pickart C, Lein PJ. Chlorpyrifos and chlorpyrifos-oxon inhibit axonal growth by interfering with the morphogenic activity of acetylcholinesterase. *Toxicol Appl Pharmacol*. 2007 Nov 17.