

OPTIMAL HEALTH UNIVERSITY™

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Nine Disorders Linked to Pesticides

Organic food is becoming more and more mainstream as concern grows about the health effects of pesticides. While you are probably concerned about pesticides, you might not know exactly what their hazards are.

Below, your doctor at Spinal and Sports Care Clinic lists nine serious health conditions that recent research attributes to pesticides, plus tips on reducing your family's exposure to these common but dangerous chemicals.

1. Poor Physical Development

Maternal pesticide exposure may endanger a child's physical development. Studies conducted in New York City examined levels of certain residential pesticides in umbilical cord blood. Investigators found an inverse association with birth length and weight — the newborns with the highest levels of pesticide exposure weighed an average of 186.3 grams less than those with the least exposure (*Environ Health Perspect* 2004;112:1125-32).

Physical differences linked to pesticide exposure may also be apparent years after birth. An investigation in Mexico compared 4- to 5-year-old children from neighboring agrarian

regions: one with and one without pesticide use. The children from the area that sprayed crops showed weaker physical stamina, less eye-hand coordination and poorer short-term memory (*Environ Health Perspect* 1998;106:347-53).

2. Poor Neurological Development

Along with physical development, pesticide exposure — particularly exposure to organophosphates — may harm children's neurological development, says your doctor at Spinal and Sports Care Clinic. Organophosphates are a group of compounds that include several common pesticides and have historically been used as chemical warfare agents because of their effects on the nervous system.

An investigation published in the medical journal *Pediatrics* evaluated 1,139 children 8 to 15 years of age for attention deficit/hyperactivity disorder (ADHD) as well as urinary concentrations of dialkyl phosphate — a component from the breakdown of organophosphates. Of these children, 119 met the diagnostic criteria for ADHD. Those with dialkyl phosphate concentrations above the median level were twice as likely to be diagnosed with ADHD (*Pediatrics* 2010;125:e1270).

Another study looked at children ages 6 to 8 in northern Ecuador, where many women work in the country's pesticide-heavy floriculture industry.

The children who had prenatal exposure to pesticides showed consistent deficits in memory and visuospatial performance, compared to the children without prenatal exposure (*Environ Health Perspect* 2010;118:890-6).

3. Dementia & Parkinson's Disease

Pesticides are hazardous to the neurological health of adults as well. One study tracked the cognitive ability of 3,084 older adults residing in an agricultural community. Over ten years, 500 developed dementia and 344 developed Alzheimer's disease. Researchers found a clear link between pesticide exposure and risk of these neurological conditions (*Neurology* 2010;74:1524-30).

Another analysis focusing on pesticide-applying farmers and their spouses showed that pesticide use increased the likelihood of developing Parkinson's disease (*Am J Epidemiol* 2007;165:364-74).

4. Depression

When scientists surveyed people who applied pesticides, they found that those who had been diagnosed with and treated for pesticide poisoning were more likely to be later diagnosed with depression. Those individuals with highest cumulative exposure to pesticides also had a significantly higher-than-normal rate of depression (*Environ Health Perspect* 2008;116:1713-9).

5. Cancer

Leukemia is the most common form of cancer in children. In one review of 31 studies, childhood leukemia showed an association with the mothers' occupational pesticide exposure (*Environ Health Perspect* 2009;117:1505-13).



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A separate review and meta-analysis of 15 studies found that the risk of childhood leukemia increases with both maternal prenatal exposure and childhood exposure to household pesticides (*Environ Health Perspect* 2010;118:33-41).

Pesticides may also be to blame for cases of several types of cancer in adults. For instance, exposure to certain pesticides boosts an individual's odds of developing melanoma and lung cancer (*Environ Health Perspect* 2010;118:812-7).

And, a survey of 30,454 farmers' wives showed that women who live closest to fields treated with pesticides have an elevated risk of breast cancer (*Am J Epidemiol* 2005;161:121-35).

6. Diabetes

One five-year study followed 33,457 people licensed to apply agricultural pesticides. The percentage who developed diabetes was significantly higher than average — up to double — for those who used certain pesticides. Odds of diabetes increased for any use of these pesticides and more so with cumulative days of use (*Am J Epidemiol* 2008;167:1235-46).

Another analysis revealed that pregnant women who have used pesticides in the past are more likely to develop gestational diabetes mellitus (*Diabetes Care* 2007;30:529-34).

7. Respiratory Problems

Chemical pesticides are among the many environmental pollutants that interfere with healthy lung function. Use of certain pesticides makes some individuals more likely to wheeze even in the absence of other common causes like smoking or a history of allergy and asthma problems (*Am J Resp Crit Care Med* 2002;165:683-9).

Because pesticides decrease levels of an enzyme required for neurological processes, they are also associated with higher rates of allergies and asthma (*Am Rev Respir Dis* 1992;146:884-7).

8. Retinal Degeneration

Retinal degeneration, the most common cause of vision loss among older adults, can be linked to pesticide exposure.

Research reveals that applying certain fungicides and insecticides bolsters farmers' odds of suffering retinal degeneration (*Am J Epidemiol* 2005;161:1020-9).

9. Menstrual & Fertility Disorders

Some pesticides can affect the reproductive system by disrupting the synthesis and function of key hormones.

Compared with average women, those who use the most hormonally active pesticides are up to twice as likely to experience longer cycles, missed periods and inter-menstrual bleeding (*Am J Epidemiol* 2004;160:1194-204).

These types of menstrual disorders are associated with heightened rates of infertility and miscarriage.

How to Reduce Pesticide Exposure

According to the Centers for Disease Control and Prevention, pesticides are detectable in the blood and urine of 95.6 percent of individuals aged 6 and older. To cut your family's exposure to pesticides, the doctor recommends taking a few simple steps.

First, choose organic produce whenever possible. The latest research shows that switching children to an organic diet can reduce their urinary levels of organophosphate pesticides to nearly undetectable levels in as little as five days (*Environ Health Perspect* 2008;116:537-42).

If you can't eat entirely organic, focus on avoiding the fruits and vegetables that carry the highest pesticide residue. Also known as the "Dirty Dozen", these include celery, peaches, strawberries, apples, blueberries, nectarines, bell peppers, spinach, cherries, kale/collard greens, potatoes and Chilean grapes.

According to the Environmental Working Group, which compiles the

"Dirty Dozen" and updates it each year, eating only organic varieties of these foods can slash overall pesticide intake by up to 80 percent.

Wash non-organic produce thoroughly and peel it if possible, but be aware that some amount of pesticide residue may be absorbed into the food.

Avoid using chemical pesticides in your home and garden. Try natural products like borax (out of reach of children and pets), diatomaceous earth and essential oils to eradicate indoor pests. In the garden, try insecticidal soap, pest-repelling plants like marigolds and citronella and beneficial predator insects like ladybugs and lacewings.

Up your tolerance to encountering the occasional bug in your home. It's far better to learn to live with a few bugs than to learn to live with a pesticide-related disease.

If you use a landscaping service, gardening service or pest-control service, switch to "green" services that use only natural products.

Take off your shoes when you enter your home to avoid tracking in pesticide residue from the outdoors.

If possible, avoid living or spending large amounts of time in commercial agricultural areas or near heavily landscaped areas, such as most commercial golf courses.

Talk to your neighbors and to people who make pest control decisions in your workplace and your children's schools about the health risks of chemical pesticides. Educate them about natural alternatives.

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