



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Dioxins Fact Sheet

This fact sheet answers frequently asked health questions (FAQs) about dioxins. It is part of a series of fact sheets describing potential health risks to children from exposures related to the World Trade Center.

What are dioxins?

Dioxins are a family of chlorine-containing chemicals that are formed when chlorinated aromatic compounds are heated or burned. Related chemicals, with similar properties, are dibenzofurans which are formed from polychlorinated biphenyls (PCBs). PCBs and related chemical compounds are found at low levels in New York and other American cities. They were typically used in electrical insulation in transformers, capacitors and power cables until their manufacture was banned in 1977. PCBs are commonly found in buildings built before 1977, such as the World Trade Center.

Sources of dioxin formation include burning of household waste, incineration of waste at factories and copper smelting. Dioxins are also unintentionally produced as a result of industrial chemical processes such as manufacture of Agent Orange, an herbicide that is no longer used in the US. Environmental contamination is evident by the presence of dioxins in air, soil, food, and even in our own body tissues. The dioxins present in the environment in low concentrations persist for long periods of time.

How are children exposed to dioxins?

The most common source of exposure is eating dioxin-contaminated food, such as meat, dairy products and fish. You can also inhale dioxins in the air or absorb it directly through the skin.

Babies may be exposed during pregnancy if mothers have eaten food contaminated with dioxins. Dioxins can cross the placenta, thus exposing the baby. Dioxins may also be found in the mother's



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breast milk if the mother has eaten food contaminated with dioxins. This is the main dietary source for dioxins in infants. This risk is small and should not discourage mothers from breastfeeding their infants, unless specifically recommended by your physician.

Where were dioxins released at the World Trade Center after the collapse?

Dioxins were formed during the fires at the World Trade Center due to burning of insulation, plastics and polyvinyl chloride found in electrical cables. In the dust near the site, dioxins were 10-30 times higher than levels of dibenzofurans.

Is my child at risk of exposure to dioxins related to the World Trade Center?

Health related standards for exposure to dioxins in the air do not exist because little is known about the effects of this route of exposure. Dietary intake is the single most important source of human exposure to dioxins. Of the food sources, animal fats are the primary source of exposure. The health effects related to dioxin exposure through the diet are poorly understood.

In the absence of such health related exposure standards, the best alternative comparison is background exposure levels. According to the EPA, the average urban concentration of dioxins in the air is 0.12pg TEQ/m³. This provides us with the best benchmark to compare the levels of dioxins measured in the air around the World Trade Center.

The EPA has been conducting air monitoring of dioxin levels at sites in and around the World Trade Center since September 2001. Monitors located directly at the site measured the highest levels of dioxins which were several orders of magnitude above background levels typically seen in inner city areas. Dioxin levels at the site remained high from September through early December and then



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declined to background by late December. However, levels from monitoring sites a few blocks from the World Trade Center, although above background level, were dramatically lower than those measured at Ground Zero. Further analysis of the dioxin air levels measured in and around the World Trade Center site is still underway.

Is my child at risk of health effects from possible dioxin exposure related to the World Trade Center collapse?

An exposure and risk assessment conducted by the EPA suggests that there is no increased cancer risk to residents living in the World Trade Center area due to dioxin exposure from the World Trade Center. We do not know if brief, high exposures to dioxins in air lead to health effects in children. However, there is little evidence of persistently high air levels of dioxins outside of the World Trade Center site. It is somewhat reassuring that the dioxin exposure in the air was limited to several months and not years. **Accordingly, we feel that the risk of health effects in children caused by dioxin exposure from the World Trade Center is probably small, although of all the exposures related to the World Trade Center, this is an area where we know the least.**

How can dioxins affect the health of children?

The most common health effect from exposure to high doses of dioxins is chloracne, an acne-like rash found on the face and upper body. Other health effects related to exposure to large amounts of dioxin include skin rashes, skin discoloration and increased body hair. Mild liver damage has also been seen from very high-level exposure to dioxins.

Another health effect of concern is the risk of cancer in adulthood. Studies suggest that workers exposed to high levels of dioxins in the workplace over many years have an increased risk of cancer.



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Animal studies support this finding of an increased risk of cancer from long-term exposure to dioxins.

Animal studies also suggest that exposure to low levels of dioxins over long periods might result in reproductive or developmental effects. The relationship between dioxin exposures and health effects in children has yet to be clearly defined.

How do we test for exposure to dioxins?

We do not recommend routine biological testing to check for the presence of dioxins in your child. Your child's Pediatrician can assess if risk factors are present for dioxin exposure by taking an environmental history and performing a complete physical.

Though there are tests available to measure the levels of dioxins in the blood and breast milk, there are no standard reference values that define a "normal" level of exposure to dioxins. Because we have all been exposed to dioxins in the environment, every person will test positive. But, this will not explain how long the exposure was or whether there will be health effects from the exposure, making the information difficult to interpret and of little use clinically.

The American Academy of Pediatrics does not recommend routine testing of breast milk for dioxins. Benefits from human milk far outweigh the risks so women should not stop breastfeeding because of concerns of dioxins.

How do we treat dioxins toxicity?

There is no known treatment to reduce the levels of dioxins in the body.



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How do we prevent further exposure?

The following may help reduce your child's exposure to dioxins:

Do not allow your children to play in areas near hazardous waste sites. Dioxins may have contaminated the soil in these areas.

Encourage frequent hand washing to prevent children from ingesting dust or soil on their hands that may have been contaminated with dioxins.



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Where can I get more information?

For more information, contact the Mount Sinai Pediatric Environmental Health Specialty Unit, Mount Sinai Medical Center, 1 Gustave L. Levy Place, Box 1512, New York, NY 10029. Phone: 1-866-265-6201 or 212-241-0938. Fax: 212-241-4309. Visit us online at http://www.mssm.edu/cpm/peds_environ.shtml.

You may also contact your local health or environmental department or regional EPA office. Or, visit the U.S. Department of Health and Human Service's Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs for dioxins.

