



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

This fact sheet answers frequently asked health questions (FAQs) about polychlorinated biphenyls (PCBs). 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 polychlorinated biphenyls?

Polychlorinated biphenyls are a family of man-made chlorinated hydrocarbon compounds that were used widely as coolants and lubricants in transformers, electrical equipment, capacitors, insulation, old fluorescent lighting, and air conditioners. They were also used as solvents in carbonless carbon paper, plastics and paints. They resist burning and are difficult to break down, making them ideal for these uses.

In 1977, use of PCBs was banned because of concerns about their long persistence in the environment and their effects on human health. Because they are difficult to break down, PCBs made over forty years ago still persist in the environment today allowing for continued exposure. The extent of this environmental impact is illustrated by the fact that PCBs are present today in the bodies of virtually all Americans, stored in fatty tissue.

How are children exposed to polychlorinated biphenyls?

There are three main routes of children's exposure to PCBs: eating food that is contaminated with PCBs, breathing PCBs in the air and absorbing PCBs directly through the skin. The primary source of exposure is through eating contaminated foods, particularly fish, meats and dairy products. The Food and Drug Administration sets regulations regarding the amounts of PCBs that are permissibly allowed in commercial food products; in fish, the level is set at 2 parts per million (ppm). PCBs are not easily broken down or excreted, allowing levels to accumulate in the body over time.

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



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

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

Where were polychlorinated biphenyls used at the World Trade Center?

Sources of PCBs at the World Trade Center site include transformers, fluorescent lighting fixtures and other electrical equipment that was produced before the ban on PCBs went into effect. Fires at the World Trade Center released PCBs from these products as well as PCB combustion products such as dibenzofurans into the air and soil of New York City.

Is my child at risk of exposure to polychlorinated biphenyls related to the collapse of the World Trade Center?

The EPA has set a limit for PCBs in air based on continuous exposure for a year. PCB levels are not allowed to exceed an average concentration of 730 nanograms/meter³ of air. This limit is well below the levels at which any known human health effects are seen. It is also well below levels shown to cause cancer in animals.

Data obtained by the EPA prior to September 11, 2001 indicate airborne PCB levels in the five boroughs of New York averaged 0.38 ng/m³. This is considered the background level of PCBs in New York City. In comparison, sampling conducted by the EPA at the World Trade Center site, from September 11, 2001 through April 24, 2002, resulted in an average PCB level of 2.58 ng/m³, a concentration above NYC background levels but still well below the EPA standard of 730 ng/m³. Even the highest levels recorded at the World Trade Center Site were below the EPA standards, ranging from 60ng/m³ to 153ng/m³. These levels seen in the first two to three weeks after the attacks, returned to background by October



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

2001, reassuring us that any potential airborne PCB exposure was of a brief duration. Furthermore, the EPA's level of exposure associated with an increased cancer risk is 1000 ng/m³, assuming a lifetime exposure. There were no reported measurements from the World Trade Center site that met or exceeded this level.

Direct absorption through the skin is a second way that children may be exposed to PCBs. Younger children are more prone to this type of exposure because they spend a lot of time crawling, walking and playing on the ground. Also, younger children frequently put their hands in their mouth allowing them to directly ingest PCBs that may have settled in dust on the ground.

To assess the potential risks associated with direct contact with skin, surface wipe sampling was conducted in schools of Lower Manhattan after the schools underwent clean-up. Surface wipe sampling can determine the amounts of PCBs on floors and window sills. Samples were obtained from schools in the World Trade Center area including P.S. 150, P.S. 234 and P.S. 89 and the three local high schools, Stuyvesant High School, the High School for Economics and Finance and the High School for Leadership and Public Service. The EPA's permissible upper limit for PCBs in surface wipe sampling is less than 2 micrograms per sample. Not one sample at any of the local schools tested at or above this limit for the period September 2001 through April 2002. These indoor sampling results further reassure us that there was not a significant risk of PCB exposure in the schools of the Lower Manhattan community.



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

To further assess potential risk of PCB exposure, a private consulting firm conducted sampling for PCBs in a Battery Park playground in January 2002 after the playground had been cleaned with a hepa-vacuum. There were no detectable levels of PCBs either in the soil or on the playground structures. This further reassures us that there is minimal risk for PCB exposure in nearby outdoor play areas for children.

How do polychlorinated biphenyls affect the health of children?

Babies exposed to high levels of PCBs during pregnancy, may have low birth weight, decreased intelligence, irritated eyes, darkening of the skin, behavioral problems, developmental delay, and slowed growth.

Children exposed to extremely high levels of PCBs may develop acne and discoloration of the skin, upset stomach, numbness and tingling of the lower legs and possibly liver damage.

The EPA has determined that PCBs are probably cancer causing. Adults exposed to high levels of PCBs at work such as electrical workers have been found to have an increased incidence of cancer of the liver and biliary tract, though still a rare event.

Lower level exposure to PCBs in the prenatal period has been shown to have an effect on school performance including decreased intelligence, memory and attention span. These effects of prenatal exposure to PCBs appear permanent and irreversible. Similar effects have not been demonstrated with exposure to PCBs that occurs during infancy and childhood. This suggests that the baby's developing brain in the womb is particularly sensitive to PCB exposure.



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

Is my child at risk of health effects from possible PCB exposure after the collapse?

We know from ongoing monitoring of the WTC site and neighboring areas that PCB levels in the air were mildly elevated above background levels but were never at or above the EPA limits for human health effects including cancer. Exposure to PCB in general was of a short duration with air levels returning to NYC background by October 2001. In addition, surface sampling for PCBs conducted at lower Manhattan schools showed no detectable levels present in the schools.

Given these factors, despite some uncertainty due to our incomplete knowledge regarding low level exposures in children, we feel the risk of health effects in children from exposure to PCBs related to the World Trade Center is very small.

How do we test for exposure to polychlorinated biphenyls?

Though there are tests available to measure the levels of PCBs in the blood and breast milk, there are no standard reference values that define a "normal" level of exposure to PCBs. Because there are still some PCBs in the environment, every person will show some level. But, this will not explain how long the exposure lasted, or whether there will be health effects from the exposure, making the information difficult to interpret and of little use clinically.

Tests of women of childbearing age in New York City prior to September 11th have shown very low levels of PCBs. Given the low levels of PCB emissions related to the World Trade Center, we are unlikely to see a measurable increase in levels of PCBs in women above the levels detected prior to September 11th.



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

The American Academy of Pediatrics does not recommend routine testing of breast milk for PCBs. The benefits of nursing far outweigh the risks associated with PCBs. We therefore strongly encourage women not to stop breastfeeding because of concerns about PCBs.

How do we treat polychlorinated biphenyls poisoning?

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

How do we prevent further exposure?

The mainstay of treatment is to minimize any further exposure to PCBs. The Agency for Toxic Substances and Disease Registry (ATSDR) has made the following recommendations:

- Avoid eating fish caught from contaminated waters. Health advisories list areas considered unsafe for fishing due to contamination with PCBs.
- Do not allow children to play with old electrical appliances or transformers, especially if there was a recent transformer fire nearby.
- If you live near a hazardous waste site, the soil may be contaminated with PCBs. Encourage children to play away from these areas.
- Do not allow your child to put objects in the mouth including soil, toys and his/her hands. Encourage frequent hand washing to prevent children from eating contaminated soil.



Mount Sinai Pediatric Environmental Health Specialty Unit WTC Polychlorinated Biphenyls Fact Sheet

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 polychlorinated biphenyls.

