

Polychlorinated Biphenyls (PCBs) Fact Sheet

April 2008

What are polychlorinated biphenyls?

Polychlorinated biphenyls (PCBs) are a group of man-made chemicals that were used widely as coolants and insulators in transformers, electrical equipment, fluorescent lighting, and air conditioners. They were also used in plastics, paints, and other building materials. They resist burning and persist a long time, making them ideal for these uses.

PCBs were banned in 1977 because of how long they last in the environment and concerns about their effects on human health. PCBs made over forty years ago are still found in the environment today so animals and people continue to get exposed. PCBs are present today in the bodies of most Americans, stored in fatty tissue.

How are children in New York City exposed to PCBs?

The main route of children's exposure to PCBs is through eating foods that are contaminated with PCBs, especially meats, dairy products, and fish from contaminated waterways such as the Hudson River and New York Harbor. The Food and Drug Administration sets regulations on the amounts of PCBs that are allowed in commercial food products. In fish, the level is set at 2 parts per million (ppm). PCBs are not easily broken down or passed from the body. Levels accumulate in the body over time.

Direct absorption through the skin is a second way that children may be exposed to PCBs. Younger children are more likely to have this type of exposure because they spend a lot of time crawling and playing on the ground where PCBs may have settled in dust. Also, younger children often put their hands in their mouth and then swallow the dust from their hands. A third but less common route of exposure is breathing PCBs in the air. Small amounts of solid PCBs can change into gas and get into the air.

Babies may be exposed to PCBs during pregnancy if mothers breathe, eat or touch things that contain PCBs. PCBs can pass from the mother's body to the baby. PCBs may also concentrate in the mother's breast milk if the mother has PCBs in her body. Breast milk is the main food source of PCBs in infants. The health risk is small and should not discourage mothers from breastfeeding their infants, unless specifically recommended by your physician.

Are PCBs in building materials a risk to children's health?

PCBs were used in building materials from the 1940s until the ban in 1977. Many of those materials, including caulk, are still present in older buildings. When building materials get old, they can break apart and make dust that will be contaminated with PCBs. These materials can also slowly emit low levels of PCB into the air. In most cases, the health risk from intact building materials is very small. Therefore, there is no need to remove PCB-containing materials as long as they are intact. However, these materials must be removed if they begin to deteriorate. The most important time to avoid contamination is when a building is being renovated and materials with PCB are being removed. See the link to the New York State PCB protocol below for more information on safe removal of PCB-containing materials.

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, darkening of the skin, behavioral problems, developmental delay, and slowed growth. An example of this type of exposure happened in Japan in the 1960s when mothers ate PCB-contaminated cooking oil.

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. These effects were seen in a community in Italy following an industrial accident at a chemical plant in 1976.

The EPA has determined that PCBs are probably cancer causing. Adults exposed to high levels of PCBs in their work, such as electricians, have been found to have a higher rate of cancer of the liver and biliary tract, but cancer in those people is still a rare event.

Exposure of babies to PCBs before birth while they are still in their mother's womb has been shown to decrease children's intelligence, memory, and attention span and to result in poor school performance. These negative effects of early exposure to PCBs appear permanent, but can be offset in part by a nurturing home environment. PCB exposure during infancy and childhood has not been seen to cause these effects.

Should children or breastfeeding women be tested for exposure to polychlorinated biphenyls?

Tests are available to measure the levels of PCBs in the blood and breast milk. Because PCBs are common in the environment, most people will show some level. The problem, though, is that there are no reference values that define a "normal" level of exposure to PCBs. Thus, your physician will not be able to tell you the meaning of a PCB level in your blood or breast milk beyond the fact that it is present. A test that shows PCBs in your blood will not explain how long the exposure lasted or if there will be health effects from the exposure.

As there is no treatment to remove PCBs from the body, the most important action to protect yourself and your baby is to minimize exposure. To accomplish this, please see the recommendations below.

The American Academy of Pediatrics does not recommend routine testing of breast milk for PCBs. The benefits of nursing greatly outweigh the risks associated with exposure to PCBs after birth. We strongly encourage women to continue breastfeeding. Breast milk, even when it contains measurable levels of PCBs, is still far and away the best food for babies.

How do we treat polychlorinated biphenyls poisoning?

There is no known treatment to reduce the levels of PCBs in the body. For children who were exposed to PCBs during pregnancy, the best action is to provide a healthy and stimulating home and school setting, follow their development closely with their pediatrician, and provide early intervention services if there is any concern that the child is not developing normally.

How do we prevent further exposure?

- Avoid eating fish caught from contaminated waters. Health advisories list areas considered unsafe for fishing due to contamination with PCBs.
- Schools and homes should be cleaned using wet wiping techniques (wet mops or wet cloth) with detergents to remove PCB residue and dust and reduce spreading of dust.
- For buildings constructed before 1977, alert building managers to loose or cracked building materials for proper removal. Any removal of old PCB-containing materials must be done by certified abatement workers who have been trained to do the job safely.
- Do not allow children to play with old electrical appliances or transformers.
- Until soil testing has shown no PCB contamination near old buildings, encourage children to play away from these areas.
- Wash children's hands and toys often with soap and water to prevent children from eating contaminated dust and soil.

Where can I get more information?

- New York State Department of Health sport fish and game advisory: www.health.state.ny.us/environmental/outdoors/fish/fish.htm
- Protocol for Addressing PCBs in Caulking Materials in School Buildings from the New York State Education Department Facilities Planning, June 2007: www.emsc.nysed.gov/facplan/HealthSafety/PCBinCaulkProtocol-070615.html
- U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs for polychlorinated biphenyls: www.atsdr.cdc.gov/tfacts17.html
- New York City Department of Health and Mental Hygiene Fact Sheet: PCBs in New York City Schools Buildings: www.nyc.gov/html/doh/html/epi/pcb.shtml