

POLYCHLORINATED BIPHENYLS (PCBs) FACT SHEET AND FAQs JULY 2008



This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls (PCBs). This information is important because PCBs have the potential to cause negative health effects in people. The effects of exposure to any hazardous substance depend on the dose, duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

Polychlorinated Biphenyls

What are Polychlorinated Biphenyls (PCBs)? Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor. PCBs have been used as coolants and lubricants in transformers, capacitors and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens when PCBs enter the environment? PCBs entered the air, water and soil during their manufacture, use and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs. PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators. PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil. PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs? Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago can expose you to PCBs. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure. Eating contaminated food is another way to be exposed.

The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat and dairy products. Breathing air near hazardous waste sites and drinking contaminated well water can cause exposure. Workplace exposure can occur during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health? The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs. Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer? The U.S. Department of Health and Human Services has concluded that PCBs may reasonably be anticipated to be carcinogens. The Environmental Protection Agency and the International Agency for Research on Cancer have determined that PCBs are probably carcinogenic to humans (liver and biliary tract).

How can PCBs affect children? Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies who weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. PCBs may be passed from mother to unborn child. In most cases, the benefits of breastfeeding outweigh any risks from exposure to PCBs in mothers' milk.

Additional Information

NC Fish Consumption Advisories www.epi.state.nc.us/epi/fish/
Agency for Toxic Substances and Disease Registry www.atsdr.cdc.gov