Source: Illinois Department of Public Health

Polychlorinated Biphenyls (PCBs)

This pamphlet provides answers to frequently asked questions about polychlorinated biphenyls (PCBs). It describes PCBs, where they can be found, how they can affect your health, and what you can do to prevent or reduce exposure to them.

While on vacation, a family decided to charter a boat to fish Lake Michigan. They were advised not to eat any chinook salmon longer than 32 inches because of possible contamination from PCBs. They were also told that children and women of childbearing age should not eat chinook salmon that are 21 to 32 inches long.

WHAT ARE PCBs?

PCBs are a group of more than 200 similar manmade chemicals. They are oily liquids or solids, clear to yellow in color, with no smell or taste. PCBs are found as mixtures, and are very stable and resistant to extreme temperature and pressure. They were manufactured in the U.S., mainly under the trade name Aroclor, by Monsanto Inc.

PCBs were used widely in electrical equipment like capacitors and transformers. They also were used in hydraulic fluids, heat transfer fluids, lubricants, plasticizers, and as components of surface coatings and inks. More than 1 billion pounds of PCBs were manufactured in the U.S. since they were first commercially produced in 1929. Commercial production of PCBs ended in 1977 because of health effects associated with exposure. In 1979, the U.S. Environmental Protection Agency (USEPA) banned the use of PCBs, but the agency did not require the chemcials be removed from commerce. So, PCBs are still present in many products made before 1979.

HOW DO PCBs GET INTO THE ENVIRONMENT?

PCBs have been released into the environment through spills, leaks from electrical and other equipment, and improper disposal and storage. It is estimated that more than half of the PCBs produced have been released into the environment. Once in the environment, PCBs can be transported long distances. They have been detected in air, water, soil, and sediments throughout the world.

PCBs last a long time in the environment before breaking down and may find their way into the food chain. Low levels of PCBs can be found in fish, shellfish, meat, poultry, milk, dairy products, and other foods. Since PCBs have not been made since 1977, the levels in the environment have been declining over the past several years. Predators at or near the top of

the food chain (e.g. birds, fish) have the highest levels of PCBs in their bodies.

HOW CAN I BE EXPOSED TO PCBs?

Since PCBs are found throughout the environment, it is likely that everyone has been exposed to them. Persons living near a hazardous waste site with PCB contamination may be exposed to higher levels. PCBs can enter the body by eating or drinking contaminated food, through the air we breathe, or by skin contact. PCBs are easily absorbed by the body and are stored in fatty tissue. PCBs are not eliminated well, so they can accumulate in the body.

In Food

Most people are exposed to PCBs by eating contaminated fish, meat, and dairy products. Some bottom-feeding, freshwater fish may eat sediments containing PCBs while scavenging. Catfish, buffalo, and carp usually have the highest PCB levels. Plants take up only small amounts of PCBs from the soil, so amounts in grazing animals and dairy products are generally lower than in fish. Dust contaminated with very small levels of PCBs may be found on the outer surfaces of fruits and vegetables.

In Water

PCBs do not dissolve well, so exposure to them from water is usually not a concern. Some private wells may use old submersible pumps that contain PCB oil. If the pump seal fails, PCBs can leak into the well and contaminate the drinking water. People are generally not exposed to PCBs in surface waters unless they contact contaminated sediments.

Indoor Air

Older fluorescent lights found in schools, offices, and homes may still contain transformers or ballasts that contain PCBs. If the ballasts fail, PCBs can leak out and contaminate exposed surfaces and the air. PCB levels measured in the air after a light ballast failure can be significant.

In the Workplace

The workplace may also be a source of PCB exposure. Industrial accidents have been responsible for most cases of PCB poisoning in humans. Firefighters and cleanup crews responding to electrical system fires and hazardous waste accidents also may be exposed to PCBs.

HOW CAN PCBs AFFECT MY HEALTH?

Coming in contact with PCBs does not mean you will get sick or have health problems. Getting sick from being exposed to PCBs depends on the following:

- the amount of PCBs that entered your body,
- how long you were exposed to PCBs,
- how sensitive your body is to PCBs, and
- whether the PCBs were combined with other chemicals.

The health effects associated with exposure to PCBs have been studied in both humans and animals. Several factors have complicated the evaluation of health effects. Some PCB mixtures have a greater ability than others to harm your body. Impurities in PCB mixtures, like furans and dioxins, may be more toxic than PCBs at lower concentrations.

In people, PCBs can affect the skin and may cause *chloracne*--small, pale, yellow skin lesions that may last from weeks to years. PCBs also can cause short-term changes in the activity of the liver, but without any noticeable symptoms. These liver changes are similar to those resulting from the consumption of alcoholic beverages or smoking cigarettes. Animal studies also have suggested that PCBs can affect the immune, endocrine, and reproductive systems, but these effects are uncertain in humans.

Large amounts of PCBs given to laboratory animals over a short time can cause cancer. Studies of human workers exposed to high levels of PCBs for long periods have not consistently shown that PCBs cause cancer in humans. USEPA has classified PCBs as *probable* human carcinogens (cancer-causing chemicals), but there is no evidence that PCBs cause cancer at the low levels normally found in the environment.

IS THERE A MEDICAL TEST FOR PCBs?

Most people have a measurable amount of PCBs in their bodies. Tests are available to measure PCBs in the blood, body fat, and breast milk. A blood test is the best method for measuring exposure to large amounts of PCBs. Although measuring PCBs in the body is possible, the analysis is expensive, time-consuming, and not generally recommended because the results do not predict health effects or treatment.

HOW CAN I REDUCE OR PREVENT MY EXPOSURE TO PCBs?

Avoiding contact with contaminated soils and sediments can reduce your exposure to PCBs. Exposure can be further reduced by following the *Guide to Eating Illinois Sport Fish*, available from the Illinois Environmental Protection Agency (copies are available by calling 217-782-3362). This guide recommends what fish you should and should not eat and how to properly prepare fish for eating. Because PCBs accumulate in fish fat, people can reduce their intake of PCBs by removing the skin and fatty areas from fish fillets. Do not fry fish. Instead, barbecue, broil, or bake fish on an elevated rack that allows fat to drip away. You can also poach fish if you discard the broth.

Another way to avoid exposure to PCBs is to wash fruits and vegetables before eating them. Old fluorescent lights containing PCBs should be replaced and discarded before they fail and leak. If PCBs leak, contact the Illinois Department of Public Health (IDPH) for instructions on how to clean the area. If an oily film or fuel odor is noticed in your well

water and you have a submersible pump, check to see if the pump has failed. If it has, replace it and contact IDPH for instructions on how to clean the well.