ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

POLYBROMINATED BIPHENYLS (PBBs)

Division of Toxicology ToxFAQs™ **September 2004**

This fact sheet answers the most frequently asked health questions (FAQs) about PBBs. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polybrominated biphenyls (PBBs) are chemicals produced by human activity and are found in plastics used in many consumer products to make them difficult to burn. PBBs are no longer produced but can still be found in the environment. Some people who ate food contaminated with PBBs in the 1970s had skin problems. PBBs have been found in at least 9 of the 1,647 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are PBBs?

Polybrominated biphenyls (PBBs) are manufactured chemicals. They are added to the plastics used to make products like computer monitors, televisions, textiles, plastic foams, etc. to make them difficult to burn. PBBs can leave these plastics and find their way into the environment. PBBs are usually colorless to off-white solids. PBBs are mixtures of brominated biphenyl compounds known as congeners.

In the United States, manufacturing of PBBs was stopped in 1976. PBBs are still around in the environment because they do not degrade easily or quickly.

What happens to PBBs when they enter the environment?

❑ PBBs entered the air, water and soil during their manufacture and use before 1976.
❑ PBBs enter the environment from poorly maintained hazardous waste sites and from the improper incineration of plastics containing PBBs.
❑ PBBs are stable in the environment, and can accumulate up the food chain.

How might I be exposed to PBBs?

❑ Exposure to PBBs is most likely to occur by ingesting contaminated foods and drinks.
❑ People living in the lower peninsula of Michigan, where animal feed was accidentally contaminated with PBBs in 1973, may still be exposed by eating contaminated fish, dairy products, and meat.
❑ If you don't live in Michigan, exposure to PBBs is likely to be very low.
❑ You can be exposed to PBBs in the air if you live near a waste site that contains PBBs.

How can PBBs affect my health?

Most of what we know about the health effects of PBBs in people comes from studies of people in Michigan who ate PBB-contaminated animal products for several months. Some residents complained of nausea, abdominal pain, loss of appetite, joint pain, fatigue, and weakness. However, it could not be clearly established that PBBs were the cause of these health problems.

There is stronger evidence that PBBs may have caused skin problems, such as acne, in some people who ate

contaminated food. Some workers exposed to PBBs by breathing and skin contact for days to months also developed acne.

Studies in animals exposed to large amounts of PBBs for a short time or to smaller amounts for longer time show that PBBs can cause weight loss, skin disorders, nervous and immune systems effects, and effects on the liver, kidneys, and thyroid gland.

How likely are PBBs to cause cancer?

We do not know whether PBBs can cause cancer in humans, but we know that they can cause liver cancer in rats and mice exposed to very high concentrations of PBBs. Based on the findings in animals, the Department of Health and Human Services (DHHS) has determined that PBBs may reasonably be anticipated to be carcinogens. The International Agency for Research on Cancer (IARC) has determined that PBBs are possibly carcinogenic to humans.

How can PBBs affect children?

Children are exposed to PBBs in the same way as adults, mainly by eating contaminated food. PBBs dissolve and accumulate in fat, so PBBs can be found in the breast milk of exposed mothers and be transferred to babies. PBBs also cross the placenta and reach the fetus before babies are born.

Behavioral changes are seen in animals that were exposed to high levels of PBBs in the womb and by nursing. Such exposures also caused changes in thyroid hormone levels in the newborn animals and birth defects.

No specific health effects attributed to PBBs were found in children who ate contaminated food in the Michigan accident or in children born to mothers who ate the contaminated food.

How can families reduce the risk of exposure to PBBs?

❑ Since PBBs are no longer produced or used, the risk of exposure to these compounds is low.
❑ Do not eat fish or wildlife caught in contaminated locations; always follow posted health warnings.
❑ Discourage children from playing in the dirt near waste sites, from eating dirt, and from putting their hands in their mouths. Follow good hand washing rules.

Is there a medical test to show whether I've been exposed to PBBs?

There are tests that can detect PBBs in blood, body fat, and breast milk. These tests can tell whether you have been exposed to high levels of the chemicals, but cannot tell the exact amount or type of PBBs you were exposed to, or whether harmful effects will occur. Blood tests are the easiest and safest way for detecting recent exposures to large amounts of PBBs. These tests are not routinely available at the doctor's office, but samples can be sent to laboratories that have the proper equipment.

Has the federal government made recommendations to protect human health?

Under the Emergency Planning and Community Right-to-Know, EPA requires that emissions, transfers, and waste management data for PBBs be reported to the agency.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. Toxicological Profile for Polybrominated Biphenyls and Polybrominated Diphenyl Ethers. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.