



# Mercury and Public Health

## What is Mercury?

Mercury is a rare element in the earth's crust and is the only metal that exists as a liquid at room temperature. It occurs naturally in fossilized organic matter, particularly coal, and when coal is burned to create heat and generate electricity, mercury becomes airborne, eventually settling back to earth as dry particulates or in rain. Mercury is also used in consumer products such as thermometers, lamps, thermostats, and electric switches in cars and appliances. By mining and burning coal, and by throwing away mercury-containing devices, humans increase the amount of mercury in the environment to unnatural levels.

## Human Exposure

Mercury can enter the bloodstream through direct contact with the metal; however, people are most commonly exposed to mercury by eating mercury-contaminated fish.

Fish become contaminated when mercury released from coal-burning power plants, incinerators, and other industrial facilities reaches lakes and streams and is converted by bacteria to methylmercury, a highly toxic organic form of mercury that is fat-soluble and is absorbed by animal and human body tissue. Methylmercury is consumed by small aquatic organisms and is passed on to the fish that eat these organisms. Since methylmercury cannot be expelled from the body, its concentration increases with each step up the food chain. This process is known as bioaccumulation. Through bioaccumulation a large predatory fish which eats many smaller fish, which in turn have eaten many small aquatic organisms, can have methylmercury levels in its body that far exceed the contamination level of the surrounding water. When a person eats a fish containing mercury, the mercury is transferred to the person, and does not leave the body through normal waste processes. A human's mercury levels therefore increase with every contaminated fish she or he eats.

## Public Health

A potent neurotoxin, mercury causes the most harm to young children, infants, and developing fetuses. Mercury can be passed through the placenta from a mother to a fetus and through breast milk to a newborn child.

Exposure slows fetal and child development and causes irreversible deficits in brain function including attention deficit, autism, and mental retardation. In the U.S., one in 7 women of childbearing age has blood mercury levels that exceed those considered safe, and the National Academy of Sciences estimates that 60,000 children are born each year with prenatal exposure to unsafe mercury levels.

In 2001, the Food and Drug Administration advised pregnant women and women of childbearing age not to consume shark, swordfish, king mackerel, and tilefish, since these are all large predators that retain high levels of methylmercury. 2003 FDA studies indicate that albacore tuna, grouper, sea bass, orange roughy, sea trout, and bluefish also regularly contain unsafe levels of methylmercury, although consumer warnings have yet to be issued.

## Minimizing Exposure

All consumers should pay attention to fish advisories regarding mercury levels. Experts recommend limiting fish intake to about once a week, and following guidelines about which fish are safer to consume, especially for pregnant women. Special caution should be given to fish from Pennsylvania waterways, many of which have even stricter advisories.

Since coal-burning power plants are the largest source of mercury emissions, energy consumers should make an effort to purchase electricity from power plants that do not burn coal, or even better, from renewable sources such as wind, solar, and hydro-power plants. This will decrease an individual's contribution to mercury contamination of lakes and streams and help the larger movement towards environmentally-safe industry.

Household thermometers, fluorescent lamps, and thermostats should be replaced with non-mercury alternatives. Many communities offer "hazardous waste collection days" and accept most mercury-containing devices. Mercury switches already present in cars, light trucks, and appliances should be retired and recycled. Doctors' and dentists' offices are also places to request non-mercury alternatives to mercury-containing products (i.e. dental fillings, thermometers, and blood pressure gauges).