PHYSICIANS FOR SOCIAL RESPONSIBILITY

Mercury Quick Facts

MERCURY #1 FACTSHEET

ENVIRONMENT AND HEALTH PROGRAM

What Is Mercury?

Mercury is a naturally occurring metal that has several forms. Elemental mercury is a shiny, silver-white, odorless liquid at room temperature. If heated, it is a colorless, odorless gas. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds, which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common compound, methylmercury, is produced mainly by bacteria in water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

What are Sources of Mercury?

Elemental mercury is best known for its use in fever thermometers. Mercury is also found in barometers, batteries, fluorescent lamps, switches, dental amalgams, and medical devices such as blood pressure gauges.

However, most of the mercury in our environment is emitted from industrial smokestacks. The U.S. Environmental Protection Agency has concluded that coal-fired power plants are the nation's largest source of unregulated mercury emissions attributable to human activity.[1] Other major sources include mining, smelting, and waste incineration.

What Happens to Mercury When It Enters the Environment?

Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from manufacturing plants, mining ore deposits, burning coal and mercury containing waste, and from natural degassing from the earth's crust. Mercury released into the atmosphere from various industrial activities is deposited onto soil or into waterways. Bacteria in the water then convert it to an organic form known as methylmercury. Fish absorb methylmercury from water as it passes over their gills and as they feed on other aquatic organisms. As larger fish eat smaller ones, concentrations of the pollutant increase in the bigger fish, a process known as bioaccumulation. Consequently, larger, long-lived predator fish have the highest concentrations as a result of eating contaminated prey.[2]

Health Effects of Mercury

All forms of mercury are poisonous to humans. A spectrum of health effects have been observed following exposure, with the severity of effects depending largely on the amount and timing of exposure.

Research has shown short-term exposure to high concentrations of mercury vapor causes harmful effects on the nervous, digestive, and respiratory systems, and the kidneys.

Chronic exposure to either organic or inorganic mercury can permanently damage the brain and kidneys at any age. In adults, exposure to metallic or organic mercury may affect the brain, resulting in effects such as personality changes, tremors, vision problems, poor muscle coordination, and memory loss. Toxicity for other systems such as the digestive, cardiovascular, renal, and ocular systems will vary with species, dose, and timing.

Long-term animal studies have also found that exposure to organic mercury at high levels can cause nervous system damage; damage to the kidneys, stomach, and large intestine; changes in blood pressure and heart rate; adverse effects on the developing fetus, sperm, and male reproductive organs; and increases in the number of spontaneous abortions and stillbirths.

The developing fetus and young children are most sensitive to the effects of mercury exposure, even at low levels. The developing nervous system and brain are highly sensitive to mercury in any form, but particularly to methylmercury and mercury vapors. Maternal exposure to organic mercury may lead to brain damage, mental retardation, poor coordination, speech difficulties, and other serious effects on the fetus and newborn. These effects can be seen even when the exposed mother exhibits no symptoms of mercury poisoning. Children born to women exposed to methylmercury have shown a variety of abnormalities

including delays in development and learning ability. Recent epidemiological studies found that children exposed to low levels of mercury before birth experienced subtle effects on motor skills, learning capacity, memory, and other symptoms of neurological damage.

References

1. U.S. EPA, 1997. Mercury Study Report to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States. EPA-452/R-97-004. Washington, DC:U.S. Environmental Protection Agency.
2. U.S. EPA. 1998. Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units – Final Report to Congress. EPA-453/R-98-004a. Washington, DC:U.S. Environmental Protection Agency.

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