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Backgrounder
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ATSDR AND EPA WARN THE PUBLIC ABOUT CONTINUING PATTERNS OF METALLIC MERCURY EXPOSURE

Metallic mercury is a hazardous chemical that can cause serious health problems. Children (especially very young children) and fetuses are most vulnerable. The Agency for Toxic Substances and Disease Registry (ATSDR), part of the U.S. Public Health Service, and the Environmental Protection Agency (EPA) are jointly issuing an alert to the general public. There is a continuing pattern of metallic mercury exposure in children and teenagers and in persons using certain folk medicines or participating in certain ethnic or religious practices.

It is important for the general public to understand that either short-term or long-term exposures to metallic mercury can lead to serious health problems. Human exposure to metallic mercury occurs primarily from breathing contaminated air. Other forms of mercury can be absorbed by drinking contaminated water, eating food (usually fish containing mercury), and from skin contact. At high levels, metallic mercury can cause effects on the nervous system and the developing fetus. Other forms of mercury can damage other organs. Even at low levels, metallic mercury can cause health problems. *Metallic mercury exposure can cause harm before symptoms arise.* Once released into the environment, mercury is very hard to clear up. If it is left unattended where exposures can occur, it can have dangerous effects on human health.

Incidents involving schoolchildren

In recent years, increasing numbers of metallic mercury spills and contamination involving schoolchildren have been reported:

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- In August 1994, more than 500 students in Belle Glade, Florida, were contaminated with metallic mercury after three children found 4 jars (totalling 55 pounds) of metallic-mercury in an abandoned van. The local hazardous waste materials team decontaminated the children (removed contaminated clothing and washed the metallic mercury from their skin). More than 20 families had to be evacuated while their homes were decontaminated.

- In November 1994, college students at Florida Atlantic University in Boca Raton, Florida, removed metallic mercury from one of the school's laboratories. Students living in the dormitory were evacuated and housed in a local hotel while the dormitory was decontaminated.

- In June 1996, metallic mercury was taken from a middle school in St. Joseph, Missouri, and used in and outside of school by a group of teenagers. Approximately 200 children were tested for mercury exposure; one child was hospitalized and another five underwent outpatient treatment to remove the mercury from their systems; 20 other children had mildly elevated mercury levels. Two homes and a car required extensive decontamination.

- In October 1996, a high school in Oskaloosa, Kansas and a convalescent home in Johnson County, Kansas, were contaminated with metallic mercury; 52 students and an unknown number of residents of the home were tested. On the basis of ATSDR recommendations, the school was closed for a week until indoor air levels were safe. A month later, sampling at the school identified an increase in air mercury concentrations. The school was re-evaluated and additional clean-up was done as recommended by ATSDR.

- In November 1996, ATSDR again assisted state health officials and EPA in evaluating contamination at a high school and a home in Dallas, Pennsylvania, near Wilkes-Barre. Four areas in the school had levels of metallic mercury contamination that required cleanup.

- In March 1997, a middle school student on his way to school found metallic mercury on the street in front of his home in Montgomery County, Pennsylvania. The student took the metallic mercury to school and shared it with three to four classmates. Also, in March 1997 a broken mercury thermometer was discovered after school on the floor of a bathroom stall in the boys bathroom. One thermometer was confirmed missing from the science department's inventory. The school was found to be clear of contamination with the exception of one science laboratory and the carpet in a classroom. Two homes required decontamination.

Schoolteachers, particularly science teachers, and administrators need to be aware of students' interest in mercury, especially metallic mercury, and take steps to ensure that children are aware of its dangers and that any mercury kept in school is safely and securely contained.

Incidents involving religious practices

Persons who use metallic mercury in ethnic folk medicine and for religious practices are at risk. Metallic mercury is sold under the name *"azogue"* in stores (sometimes called botanicas), which specialize in religious items used in Esperitismo (a spiritual belief system native to Puerto Rico), Santeria (a Cuban-based religion that venerates both African deities and Catholic saints), and voodoo.

The use of azogue in religious practices is recommended in some Hispanic communities by family members, spiritualists, card readers, and santeros. Typically, azogue is carried on one's person in a sealed pouch prepared by a spiritual leader or sprinkled in the home or automobile. Some botanica owners suggest mixing it in bath water or perfume and placing it in devotional candles.

General facts

The following are general facts about metallic mercury and its risks, as well as information about how people can protect themselves from exposure and resulting health effects.

What is mercury and how is it used?

Mercury occurs naturally in the environment in several forms. Metallic Mercury is the liquid form used in thermometers. Mercury is also used in other common consumer products such as fluorescent light bulbs, barometers, medical equipment such as blood pressure measurement instruments, and mercury switches in children's sneakers that light up. This alert concentrates on metallic mercury, but hazards are also associated with other types. Of these, the most common is methyl mercury contamination of fish.

How could I be exposed to mercury?

In the previously described school-associated cases, children were unaware of the dangers involved in exposing themselves and their families to this deadly poison. Adults are also often unaware of the hazards associated with mercury; some have even brought it home from work for children to play with. Just one-half teaspoon of mercury spilled in the home can be dangerous.

Adults using certain folk medicines or participating in certain religious or ethnic practices may also expose themselves and their families to metallic mercury's effects. Because metallic mercury vaporizes into the air at room temperatures, it presents an immediate health risk to anyone spending a significant amount of time in a room where metallic mercury is sprinkled or spilled onto the floor, or where opened containers of metallic mercury are present. Very small amounts of metallic mercury (for example, a few drops) can raise air concentrations to levels that may be harmful to health.

How does mercury affect health?

At high levels, metallic mercury can cause effects on the nervous system and the developing fetus. Other forms of mercury can damage other organs. Even at low levels, metallic mercury can cause health problems. Mercury exposure can begin to cause harm before symptoms arise. Once symptoms do arise, health problems related to metallic mercury poisoning can include tremors, changes in vision or hearing, insomnia, weakness, difficulty with memory, headache, irritability, shyness and nervousness, and a health condition called acrodynia.

Pregnant women and their fetuses are especially vulnerable to the toxic effects of metallic mercury because it readily passes from the placenta to the fetus. Mercury may accumulate in higher concentrations in the unborn baby than in the mother. Young children, who often play on the floor where metallic mercury may have been spilled, are particularly at risk for effects on the central nervous system. Mercury vapors are readily absorbed into the bloodstream from the lungs, and the human central nervous system, which is still developing during the first few years of life, may become damaged.

Health effects can result from short-term or long-term exposure. The body gets rid of mercury through the urine and feces. Removal of this substance from the body can take up to several months after exposure. Acrodynia is characterized by itching, swelling, and flushing; pink-colored palms and soles of the feet; excessive perspiration; rashes; irritability; fretfulness; sleeplessness; joint pains and weakness. Children exposed to metallic mercury for long periods may have trouble learning in school. When mercury levels in the body are extremely high, "chelation" therapy is necessary. Chelation therapy involves putting a chemical into the bloodstream; the chemical combines with the mercury to aid in its removal from the body.

Prevention is the key to avoiding poisoning in homes, schools, and families.

What is mercury contamination and how can I prevent it?

First, avoid using metallic mercury. Appropriate substitutes are available for nearly all uses of metallic mercury. Therefore, be sure you need to use it. If not, make arrangements to safely dispose of whatever metallic mercury you might have. If you do need to use metallic mercury, make sure it is safely stored in a leakproof container. Keep it in a secure space (e.g., a locking closet) so that others cannot easily get it. Use of metallic mercury in a controlled environment helps to reduce the risk that contamination will occur.

Mercury contamination results from exposure through the air, water, food, soil, or direct contact. Exposure to metallic mercury occurs when it is not stored in a closed container. Contamination may include the spilling of metallic mercury on clothes, furniture, carpet, floors, walls, the natural environment, and even the human body. Metallic mercury and its vapors are extremely difficult to remove from such items as clothes, furniture, carpet, floors, and walls. The vapors will also accumulate in walls and other structures in contaminated rooms. The contamination can remain for months or years, posing a risk to exposed individuals. The use of metallic mercury in a home or apartment not only poses a threat to persons currently residing in that structure, but also to those who subsequently occupy that dwelling and are unaware of the past mercury use.

Can I clean up mercury with a vacuum cleaner?

Never use a vacuum cleaner. Using a vacuum cleaner causes metallic mercury to vaporize in the air, creating greater health risks. It also ruins the vacuum cleaner.

Can electronic equipment collect mercury vapors?

Metallic mercury vapors can accumulate in electronic equipment, especially computers. When the computer is turned on, the mercury revaporizes. This cycle of metallic mercury collecting and vaporizing from computers has been seen in several incidents in schools.

What should I do to keep my home safe?

Metallic mercury is used in a variety of household and industrial items including thermostats, fluorescent light bulbs, barometers, glass thermometers, and some blood pressure machines. Care must be taken in handling and disposing of all items in the home that contain metallic mercury.

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First, **do NOT** try to vacuum or heat the metallic mercury in any way. Mercury vapors are very dangerous and are virtually undetectable. Avoid breathing mercury dust, vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. If you feel you have been exposed directly to metallic mercury, wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Provide as much clean air as possible.

For example, if a thermometer breaks, remove children from the area. Clean up the bead of metallic mercury by carefully rolling it onto a sheet of paper or sucking it up with an eye dropper. After picking up the metallic mercury, put it into a bag or airtight container. The paper or eye dropper should also be bagged and disposed of properly according to guidance provided by environmental officials or your local health department. Try to ventilate the room to the outside and close off from the rest of the home. Use fans for a minimum of one hour to speed the ventilation. If larger amounts of metallic mercury are found (for example, a jar), make sure that the metallic mercury is in an airtight container and call your local health department for instructions in how to safely dispose of it. If the larger amount is spilled, leave the area and contact your local health department and fire authorities. *Do not simply throw it away, but instead seek professional guidance.*

ATSDR and EPA do not recommend the use of uncontained metallic (liquid) mercury (that is, mercury not properly enclosed in glass as it is in thermometers) in homes, automobiles, day care centers, schools, offices, and other public buildings.

Important Telephone Numbers

- Agency for Toxic Substances and Disease Registry (ATSDR) Emergency Response Hotline (24 hours): (404) 639-0615
- National Response Center: 1-800-424-8802
- Superfund Information Hotline: 1-800-424-9346
- You may also call your local health department