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The Dangers of Mercury

Do you remember playing with silvery mercury droplets as a child? This silvery liquid is known as elemental mercury and it is most widely known for its use in thermometers. Although elemental mercury was much less regulated many generations ago, the presence of mercury has greatly decreased in the past few decades as the dangers of this substance became well known. Elemental mercury possesses significant vapor pressure to give off hazardous fumes when encountered in the liquid droplet form. The mercury vapor is colorless, odorless and hazardous. These vapors are of particular concern when located in a poorly ventilated indoor area¹, such as a small bedroom, where they can potentially exceed hazardous levels.²

Mercury acts as a neurotoxin that most commonly affects the nervous system and the kidneys; however, it can also damage the digestive, immune, and respiratory systems based on the route of exposure.³ Chronic exposure to mercury vapor can cause tremors, anxiety, sleeping problems, loss of appetite and changes in vision, while a one-time high dose can cause coughing, chest pain, nausea, vomiting, headache, increased blood pressure and death.⁴ Mercury vapors are released during the burning of fossil fuels and thus are more common near power plants.⁵ Additionally, elemental mercury is used in a wide range of items, such as thermometers or batteries, and may be encountered if these items are broken open.⁵ Please read our "Take Action" article for a comprehensive list of mercury-containing items.

There are 2 additional types of mercury: inorganic mercury compounds and organic mercury compounds. Inorganic mercury forms when mercury reacts with other elements, such as chlorine, sulfur or oxygen, to form salts or other compounds. These compounds can be found naturally in the environment, but can also result from elemental mercury spills, from some industrial processes and from chemical manufacturing.⁵ Humans are most frequently exposed to inorganic mercury when they use these compounds in their work.⁶ Although inorganic mercury is generally less toxic than the other types, it can cause nervous system damage similar to elemental mercury through chronic exposure.⁶

Organic mercury can be created through a conversion of elemental mercury or inorganic mercury by microscopic organisms in soil or water. These compounds, most notably methylmercury, are consumed by small marine organisms, such as plankton, and accumulate in the food chain.⁵ Methylmercury is considered the most dangerous of the organic mercury compounds due to its relatively high concentration in large fish, such as tuna, and its high absorption rate through the human digestive tract.⁵ People affected with methylmercury poisoning have displayed loss of peripheral vision, "pin and needle" feelings in their extremities, lack of coordinated movements, impaired speech and muscle weakness.⁷ Methylmercury is of special concern to pregnant women due to its ability to adversely affect the brain and nervous system of children exposed to high levels during pregnancy.⁸

It is evident that mercury-containing items, when not handled or disposed of correctly, could pose a risk to the environment and human health. Mercury has traditionally been used in many facets of biomedical research. The NIH uses mercury and its related compounds for many applications, which could include but are not limited to sphygmomanometers, mercury chloride (in stains), Millon's reagent (for protein tests) and more.⁸

The NIH places a special importance on the use and disposal of mercury due to the dangers to human health listed above. Please read our "Take Action" and "Staff Spotlight" articles below to learn about the current mercury regulations in the [NIH Policy Manual Chapter 3033](#) and other mercury reduction programs at NIH, such as the "[Mad as a Hatter](#)" campaign and the "[Special Exemption](#)" form for mercury acquisition. Additionally, please contact the Division of Environmental Protection at 301-496-7990 with questions regarding the purchasing, handling, or disposal of mercury at NIH.

TAKE ACTION



Do You Have Mercury in Your Workplace or Home?

Mercury and items that contain mercury must always be treated with exceptional care to prevent an accidental exposure. Learn which items around you contain mercury to ensure they are properly handled and disposed.

[LEARN MORE](#)

STAFF SPOTLIGHT

Mad as a HATTER?



Join Our Campaign for a Mercury Free NIH

The Driving Force Behind Mercury Reduction Initiatives at NIH

We would like to recognize the efforts of CAPT Ed Rau (retired), CAPT Michelle Evans, CAPT Ed Pfister and Kenny Floyd to develop the mercury reduction programs that help make NIH safe.

[LEARN MORE](#)

NEMS TRAINING

Did you know? Elemental mercury droplets have relatively low absorption through the skin, which is why many people have "played" with them without ill effect.⁹ However, the colorless and odorless vapors from these droplets are hazardous and should be avoided.⁹ To learn more about the mercury initiatives at the NIH, please visit the [NEMS Training webpage](#) to view a short (20 minute) NIH environmental awareness training video.