



Metallic Mercury Exposure

*A Guide for
Health-Care
Providers*

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METALLIC MERCURY EXPOSURE

A Guide for Health-Care Providers

Some people in Latin American and Caribbean communities, especially those who practice Santería, Espiritismo, or Voodoo, may use metallic mercury (known as azogue or vidajan) in religious and ethnomedical rituals that could adversely affect their health. Some people may use metallic mercury in folk treatments as a substitute for, or as a supplement to, conventional medical treatment.

This brochure has been developed to inform health-care professionals and providers that their patients who use metallic mercury may be at risk for mercury poisoning. It addresses the most common questions and concerns about metallic mercury:

① What is Azogue / Vidajan? ② Reasons and Means of Use ③ Routes of Exposure ④ Health Effects ⑤ Testing for Exposure and Absorption ⑥ Removal and Disposal of Metallic Mercury ⑦ Legal Issues ⑧ Addressing Patient Concerns ⑨ Additional Resources

❶ WHAT IS AZOGUE / VIDAJAN?

Azogue / Vidajan is metallic mercury.

In the English and Spanish languages, quicksilver and azogue are popular names for metallic mercury. In Haitian Creole, metallic mercury is called vidajan.

Azogue / vidajan may be commonly found in *botánicas* and religious stores that sell popular religious and non-conventional medicinal products located in Latino and Caribbean communities.

Metallic mercury can be easily identified by its shiny, silver-gray appearance. This heavy and slippery liquid metal easily breaks up into many small beads, which can join again with equal ease. When dispersed in a room, it may not be easily seen and can remain for months or years.

Metallic mercury:

- ◆ does not dissolve in water or alcohol
- ◆ is odorless but has a metallic taste
- ◆ is a liquid and a vapor at room temperature
- ◆ evaporates slowly into indoor air (and evaporates more quickly as the temperature increases)
- ◆ is invisible in vapor form

There are other types of mercury besides the metallic form. Some people confuse the **silvery** metallic mercury with the **red** mercury called mercuric sulfide (Spanish *mercurio*). Mercuric sulfide (also called cinnabar) is used as pigments in paints and tattoos. Metallic mercury is refined to its elemental form from mercuric sulfide.

Metallic mercury is sold in *botánicas* in capsules or glass vials in amounts ranging from a few grams to 3 to 5 ounces for spiritual “works” (*trabajos*). It can also be found in thermometers, electrical switches, and thermostats in the home.

Azogue / Vidajan capsules can have up to 10 times (3 to 5 ounces) more metallic mercury than one thermometer.

Mercury Vapors

Metallic mercury begins evaporating as soon as it contacts air. Higher temperatures increase the rate and amount of evaporation. Since *azogue / vidajan* capsules are not sealed, there is always a risk of evaporation from the container. The vapor particles will stick to almost anything: jewelry, carpets, draperies, clothing, furniture and cracks in floors.

Metallic mercury vapors are invisible and may persist throughout the room for many months or years. Because mercury vapors can remain within indoor environments for extended periods of time, people who live in or regularly visit these households may be at risk for exposure to harmful levels of mercury vapor. The risk of exposure may be greater during cold seasons, when people heat their homes and close their windows, trapping heat (and mercury vapors) inside. Changes in temperature can cause fluctuations in the concentration of indoor mercury levels.

Mercury vapor is denser than air and settles near the floor. **Children are at a greater risk of exposure because they spend more time on the floor.** Younger children in particular can be exposed to more of the invisible vapors because they often crawl or play on the floor, and generally have higher respiration rates.

Ⓢ REASONS AND MEANS OF USE

Industrial Uses

In the past, metallic mercury was a common ingredient in pharmaceutical products, was used in industry to coat mirrors, and could be found in some paints (prior to 1991). Today, this liquid metal is found in electrical equipment (e.g., batteries), weather instruments (e.g., thermometers, barometers, manometers, switches), and dental amalgams. It is also used in factories to produce chlorine gas and in “informal” gold extraction as well as the industrial gold mining process.

Spiritual Uses

The use of *azogue* can vary widely among individuals. *Azogue* has particular significance in *Santería* or *Lucumí* religion. The metal “works” for *Eleggúá*, an African Yoruba god and one of the *Siete Potencias Africanas* (The Seven African Powers), called upon by believers to open paths and remove obstacles. *Azogue* is also one of the seven basic metals of *Santería*. It is believed that the metal *azogue* can give either *resguardo* (protection) or *cantazo* (a strike against a person, bringing harm and illness).

Espiritismo, also called “the work of the spirits,” is a traditional healing practice in which people maintain relationships with the “*protecciones*”—the *ángel guardian* (guardian angel) and *guías* (spirit guides).

Adherents believe that *azogue* has spiritual powers similar to its characteristics as a metal. Just as *azogue* moves quickly, likewise it “speeds” the “works” of *Santeros* and *Espiritistas*.

Practitioners of *Santería*, *Espiritismo*, or *Voodoo* may periodically use *azogue* or *vidajan* in practices to seek spiritual aid from the gods or spirits. It is used in a variety of ways for various reasons.

It may be:

- ◆ placed in floor washes or sprinkled directly onto the floor to cleanse or protect the home
- ◆ ingested to cure stomach ailments
- ◆ applied to the skin or used in baths for spiritual cleansing
- ◆ placed in oil lamps or candles for protection and to increase good fortune
- ◆ kept inside a vial or charm bag for protections or as amulets
- ◆ offered as petitions to the Yoruba gods
- ◆ used for love spells

③ ROUTES OF EXPOSURE

It is hazardous to use metallic mercury and breathe its vapors. There is always a risk of mercury intake whenever it is used.

Inhaling Mercury Vapors

Metallic mercury is harmful when ingested, but even **more dangerous** when inhaled. The vapors rapidly diffuse through the lungs and enter the bloodstream. The mercury is converted to different physical and chemical states, and distributed to tissues throughout the body. Almost 80% of inhaled metallic mercury vapor is absorbed by the body. The mercury accumulates in the kidneys and brain. Some of the inhaled mercury is exhaled, or released through urine or excrement.

Ingesting Mercury

Ingested metallic mercury is usually converted to a non-diffusible form that prevents it from easily entering the bloodstream. Most of it goes through the gastrointestinal tract and is expelled from the body through excrement. Less than 1% of ingested metallic mercury is absorbed by the body. About half of the mercury ingested will be excreted after 35 to 90 days. While in adults, ingesting small quantities of metallic mercury may not immediately result in noticeable health effects, the same amount of mercury can make a child sick due to their smaller body size and because the developing organs are very sensitive.

Applying Mercury to the Skin

Metallic mercury that is rubbed on the skin or used in spiritual baths may evaporate and be inhaled. Smaller amounts may also enter the bloodstream directly through abraded skin and accumulate in the kidneys and the central nervous system.

④ HEALTH EFFECTS

Metallic mercury may cause permanent damage to the brain and kidneys, and may even cause death.

The type of damage to the body caused by this form of mercury is determined by how much and for how long the person is exposed to it. Vapors may be fatal if inhaled in large amounts for even a brief period of time.

Metallic mercury can persist in the body for months; mostly in the kidneys and brain. The most affected part of the body is the nervous system.

The half-life of metallic mercury in humans is approximately 30-40 days in blood and about 60 days in urine. Mercury vapor is lipid-soluble and readily crosses the blood-brain barrier and the placenta. Mercury can be detected in the brain for many years after an exposure.

Depending on the level of exposure, the appearance of signs and symptoms may vary. Health effects can occur within hours (acute) or over weeks, months or even years (chronic). Acute poisoning symptoms would be expected to occur only after exposure to very high concentrations.

Signs and Symptoms of Short-Term (Acute) Exposure:

- ◆ cough
- ◆ difficulty breathing
- ◆ chest pain
- ◆ nausea, vomiting
- ◆ diarrhea
- ◆ fever
- ◆ metallic taste in the mouth
- ◆ renal failure (shock and acute renal dysfunction)

Signs and Symptoms of Long-Term (Chronic) Exposure:

- ◆ stomatitis, gingivitis
- ◆ tremors
- ◆ erethism (strange irritability and marked shyness)
- ◆ memory loss
- ◆ headache
- ◆ fatigue, insomnia
- ◆ depression
- ◆ loss of appetite and weight loss
- ◆ behavioral and cognitive difficulties
- ◆ decreased lung vital capacity
- ◆ renal failure
- ◆ burning eyes and conjunctivitis
- ◆ rashes and peeling skin on palms of hands and soles of feet

The use of mercury in ethnomedical or religious practices typically involves small quantities administered over time. Thus, affected individuals would likely exhibit chronic symptoms.

Symptoms associated with metallic mercury exposure may be general in nature (fatigue, nausea, headaches), and often can be mistaken for symptoms of other conditions or illnesses. For this reason, mercury poisoning may be difficult to diagnose.

Mercury and Children

Metallic mercury has the greatest effect on the fetus and small children, and their developing central nervous systems.

Metallic mercury will reach the fetus of a pregnant woman.

It is important to protect pregnant women and small children from metallic mercury. It will enter the fetal bloodstream through the placenta and may produce permanent damage to the child's developing organs, especially the brain, kidneys, lungs and liver. Nursing mothers who inhale the vapors can also affect infants through breast milk.

Toddlers who crawl on floors contaminated with mercury can inhale or ingest it. The amount and frequency of mercury exposure determines the impact on a child's development. However, the younger the child, the greater the risk of long-term neurological and developmental effects.

Children are more susceptible to mercury toxicity because their organs exhibit higher absorption and retention rates of mercury, and their nervous systems are highly sensitive to the metal.

Some children exposed to metallic mercury can develop a condition called acrodynia or “pink disease.”

Signs and Symptoms of Acrodynia in Children:

- ◆ severe leg cramps
- ◆ irritability
- ◆ numbness, prickling or tingling
- ◆ painful pink fingers
- ◆ peeling hands, feet and nose
- ◆ rash
- ◆ heavy sweating
- ◆ sensitivity to light

⑥ TESTING FOR EXPOSURE AND ABSORPTION

Since users of metallic mercury may not be aware of its harmful effects, they may not mention it to their health-care providers. *It is important to ask patients if they use non-conventional or folk / traditional treatments for ailments and if any of those remedies contain mercury (azogue or vidajan).*

Environmental Testing

Metallic mercury vapors are invisible and odorless. A mercury vapor analyzer, a small machine that measures the level of mercury in the air, can be used to detect mercury within indoor environments. This measurement takes only a few minutes and the results are immediate.

Medical Testing

Several laboratory tests measure the levels of all forms of mercury in the body. Blood or urine samples can be tested for metallic mercury levels. Hair samples can be tested for long-term exposure to methylmercury (the form of mercury found in some fish), if careful testing methods are used. **But a urine test is the recommended way to measure metallic mercury levels in the body.**

The New York State Heavy Metals Registry has established reportable levels for elevated mercury. The reportable levels are concentrations at or above 5 ng/ml in blood, and at or above 20 ng/ml in urine. The mercury level in blood reflects exposure to all forms of mercury, and may therefore be influenced by dietary intake (i.e. fish).

Ideally, in order to determine elevated mercury levels, urine samples should be collected over 24 hours, but spot urine samples can be used instead, if corrected for creatinine levels. If patients report using metallic mercury, or a spot urine sample has elevated results, then a 24-hour urine collection, corrected for creatinine, should be analyzed.

For blood or urine sample analysis call the **New York State Clinical Laboratory Evaluation Program at (518) 485-5378** to find the nearest laboratory certified to conduct mercury analyses.

Treatment

Determining and eliminating exposure is the most important step in the treatment process.

There are several ways to enhance elimination of mercury from the body. Duration of use, symptoms of exposure, and mercury levels determine when and how to treat a patient exposed to mercury.

Chelators, specific agents that bind to mercury to form a nonpoisonous compound that can be excreted from the body, can reduce the body burden of mercury. Chelation should be reserved for individuals who have evidence of very high mercury absorption and significant symptoms. The appropriate chelator to use depends on the form of mercury to which a person has been exposed and the health status of the individual.

Some types of chelators are contraindicated for elemental and organic mercury compounds because of the possibility of increased neurotoxicity, so expert consultation should be sought prior to treatment.

To receive more information about testing or treatment procedures, call the **Mount Sinai Occupational Health Clinic at (212) 987-6043** or **Bellevue Occupational Health Clinic at (212) 562-4572**. Both clinics are part of the New York State Network of Occupational Health Clinics and have experience in evaluating mercury exposure.

⑥ REMOVAL AND DISPOSAL OF METALLIC MERCURY

Common household appliances should not be used to collect spilled metallic mercury. Brooms and mops will only spread the contamination. Vacuum cleaners will disperse the mercury into droplets, and the heat they generate can increase vaporization. Mercury should never be discarded into sinks, bathtubs or toilets, as it may become trapped, evaporate and re-enter the home.

When cleaning up a mercury spill, care needs to be taken to avoid contaminating clothing, shoes, and

jewelry. Metallic mercury readily binds to gold and can permanently damage jewelry.

Small amounts of metallic mercury (like the amount found in fever thermometers) can be cleaned up from hard surfaces such as tile, wood, or linoleum floors. But, if it has been spilled or placed on carpets, upholstery or porous surfaces they **should be discarded** or specially cleaned with mercury spill kits and detergents.

Mercury spill kits are sold by safety equipment distributors, industrial safety supply outlets and laboratory safety services. Check under *environmental and ecological products and services* or *laboratory safety services* in phone books.

If patients need information on how to clean up small mercury spills they can call:

NYC DEPARTMENT OF HEALTH
Bureau of Environmental and Occupational Disease Prevention
(212) 788-4290 (Business Hours)

Poison Control Center
(212) 764-7667 (24 hours a day)

If a large amount of mercury has been spilled in a home or business, people should call:

NYC DEPARTMENT OF HEALTH
Poison Control Center
(212) 764-7667 (24 hours a day)

NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION
(718) DEP-HELP (24 hours a day)

If a person has a large amount of mercury in their home or business and wants to dispose of it, the NYC Department of Environmental Protection can recycle the mercury.

For more information about recycling mercury, call the NYC Department of Environmental Protection during business hours at (718) 595-4784.

⑦ LEGAL ISSUES

It is not illegal to use or sell mercury. However, Federal and New York City law requires that mercury containers be properly labeled alerting people to the hazards associated with mercury.

⑧ ADDRESSING PATIENT CONCERNS

In order to improve the well-being of your patients and their families, they should be aware of the potential dangers of mercury use. Children are at particular risk for harmful effects. As a physician, you can respect your patients' religious beliefs and still provide effective health care. Patients should be asked about their use of traditional/folk treatments and educated about the dangers of metallic mercury (*azogue /vidajan*). They should be aware of how to find out about alternatives that will allow them to continue practicing their religious or cultural beliefs, using safer substances.

Information about these alternatives can be found in the books sold in *botánicas*. Patients can also be encouraged to ask their *espiritista*, *santero*, or *doktè fey* to suggest other things that may be used in place of *azogue* or *vidajan*.

A patient education brochure is available from the New York City Department of Health. The brochure discusses the health effects associated with using *azogue / vidajan* (metallic mercury) and includes steps for cleaning up small amounts of *azogue / vidajan* in homes. For copies, call (212) 788-4290.

⑨ ADDITIONAL RESOURCES

NEW YORK CITY DEPARTMENT OF HEALTH Bureau of Environmental and Occupational Disease Prevention

125 Worth St., CN-34C
New York, NY 10013
(212) 788-4290 (Business Hours)

{For information on indoor air testing, medical and environmental levels of concern, potential assessments, patient brochures and methods for clean up of small amounts of mercury.}

NEW YORK CITY DEPARTMENT OF HEALTH New York City Poison Control Center

455 First Ave. CN-81
New York, NY 10016
(212) 764-7667 (24 hours)

{For help in acute poisoning situations and for clinical and treatment information}

NEW YORK STATE CLINICAL LABORATORY EVALUATION PROGRAM

(518) 485-5378

NEW YORK STATE NETWORK OF OCCUPATIONAL HEALTH CLINICS

New York City:

Bellevue Occupational Health Clinic

First Ave. at 27th St. Rm CD349
New York, NY 10016
(212) 562-4572

Mt. Sinai- Irving J. Selikoff Center for Occupational and Environmental Medicine

One Gustave L. Levy Place, Box 1058
New York, NY 10029
(212) 987-6043

NEW YORK STATE DEPARTMENT OF HEALTH

Bureau of Toxic Substances Assessment

1-800-458-1158 (toll free within NY State)

{Information on indoor air testing and the Environmental
Laboratory Approval Program}

**NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL
PROTECTION**

(718) DEP-HELP(24 hours a day. To report a large mercury spill.)

(718) 595-4784 (Business hours. For information on mercury
recycling).

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