



MOUNT SINAI
SCHOOL OF
MEDICINE

MOUNT SINAI – IRVING J. SELIKOFF CENTER FOR OCCUPATIONAL & ENVIRONMENTAL MEDICINE

Medical Treatment for an Elemental Mercury Exposure Incident

This fact sheet only addresses elemental mercury (the pure form of the metal, when it is not combined with other chemicals). There are other forms of mercury, such as compounds found in contaminated fish, known as organic mercury.

Workers who experience a one-time sudden exposure to any chemical substance at work, should:

- Gather as much information as you can about the type and amount of exposure, including labels, Material Safety Data Sheets (MSDS), and the medical emergency phone number on the MSDS.
- If you are feeling ill, seek medical attention at an emergency department (ED) immediately. It is best if a medical toxicologist is consulted as part of your visit to the ED. They can be reached for advice about treatment by having the healthcare professional contact the Poison Control Center at 1-800-222-1222.
- You can call the PCC independently for recommendations as well.
- Once the urgent situation has been taken care of, you may contact the nearest occupational health clinic in New York State (<http://www.health.state.ny.us/environmental/workplace/clinic.htm>) or in the country (<http://www.aoec.org/directory.htm>) for recommendations and follow-up.
- This fact sheet is not a substitute for medical care. The purpose is to direct the exposed worker to the proper medical provider.
- Report any exposure to your employer immediately. Complete an incident or exposure form. If none is available, write a memo informing them of the exposure incident (date, time, location, what you were doing in the area, and for how long). Keep copies and insist that documents are placed in your personnel files.

How can I be exposed to elemental mercury?

Elemental mercury is a silver, odorless liquid. At room temperature, it will partly vaporize to a colorless, odorless gas. The hotter it is, the more will evaporate into the air. It is found in old thermometers, old blood pressure machines, dental amalgam, fluorescent light bulbs, batteries, switches (including thermostats), meters, science classrooms and laboratories, industrial and electronic waste, and materials used in religious rituals. *Improper clean-up of spills can lead to overexposures.*

Breathing in elemental mercury is the most common route of exposure. If you get it on your skin, small amounts of it may be absorbed slowly, and it may irritate your skin. If swallowed in small amounts, it will pass through your body with almost no absorption, as long as your gastrointestinal tract is normal.

What are the symptoms and illnesses caused by overexposure?

Short term (hours) inhalational exposure to high levels of elemental mercury can result in cough, chills, fever, shortness of breath, and sometimes nausea, vomiting and diarrhea. Other symptoms may include weakness, headache, metallic taste, visual disturbance, wheezing, high blood pressure, irregular heartbeat, personality changes, tremor and redness of the skin. Rapidly after a major exposure, or more delayed following a prolonged smaller exposure, you may develop lung damage, excessive salivation, gastrointestinal problems, and kidney damage. Children under 30 months of age are at increased risk of lung failure. Longer exposure (years) to lower levels of mercury can result in damage of the lining of the mouth and/or the lungs, as well as brain, kidney and nerve damage.

Do I need immediate medical care?

If you have been exposed to elemental mercury and develop cough, chest tightness or pain, shortness of breath, excessive saliva, decreased urine, or change in urine color, *within hours or days*, you need immediate medical care. Some physicians recommend that if you have been exposed in an enclosed area where mercury has been recently heated, you should seek immediate care. If mercury liquid gets in your eye or large amounts get on your skin, decontaminate the area by flushing with water, and proceed to seek medical care as above. Low-level exposures (such as a broken light bulb or thermometer) usually lead to no lasting health effects and medical treatment is not needed.

Do I need to see a doctor and what kind?

You should see a specialist in occupational and environmental medicine or in medical toxicology if you continue to have symptoms or abnormal urine levels. If you were exposed to large amounts of mercury in an area where mercury was heated, vacuumed or swept with a broom, even if you are not presenting any symptoms, evaluation by such specialist physician is recommended as well. If you are pregnant and have been exposed, you should see your obstetrician, even if you had no symptoms. The physician would do a thorough exam and pay special attention to your lungs, kidney, nervous system, heart, mouth and eyes.

Do I need certain tests and how quickly?

Specific tests for the presence of mercury in blood and urine can be useful to assess your level of exposure. Lung function tests can assess lung damage. In cases of severe mercury poisoning, your physician may recommend a complete blood count, blood tests for kidney and liver function and urine tests. For severe inhalation exposures, a chest x-ray and blood gases are recommended. Abdominal x-rays should be ordered if you have ingested more than a small amount of elemental mercury (more than the contents of a thermometer). Neurobehavioral tests, nerve conduction tests, and testing the urine for certain proteins can assess long term nervous system and kidney effects.

Are there tests that would prove I have recently been exposed?

Blood tests can show recent exposure, but must be done quickly, since half of the mercury will be gone from the blood within 3 days. Blood tests may, however, be positive from eating contaminated fish. Urine tests are used to detect elemental mercury (not dietary) exposures. It takes 60 to 90 days to rid half the mercury from your body by urination. Urine tests can be compared to normal population levels to prove whether you have been exposed in the last couple of months. Urine tests that are performed after you have been prescribed a drug that releases mercury from your tissues (chelation or provocation) are not meaningful and not recommended.

What is the treatment for acute exposures?

If elemental mercury is inhaled, patients are removed from exposure and may need rescue breathing, oxygen, medicine to open up the breathing passages, or even mechanical ventilation. If mercury gets on the skin, it should be washed to prevent further exposure. If mercury is swallowed, one should NOT induce vomiting or give activated charcoal. Treatment is not necessary for ingestion, unless extremely large amounts are swallowed or you have a prior serious gastrointestinal tract condition (such as active ulcerative colitis).

Symptomatic patients may be treated by chelation therapy (removal of the metal by binding it to another chemical that is easily eliminated from the body). Chelation is generally reserved for life-threatening cases and should not be used simply to reduce levels in the absence of symptoms. It should be administered by doctors with expertise in this type of treatment and usually in consultation with a medical toxicologist or poison control center.

What follow-up is needed?

Follow-up by an occupational or environmental physician or medical toxicologist should be conducted if you had a large exposure, or if you have symptoms or elevated urine levels.

How does this information apply to children and others in the community?

For mercury, the above information is generally applicable to persons of all ages. Young children are at higher risk of poisoning from all chemicals than adults. In the case of mercury spills, there is additional concern because they breathe air that is closer to the floor. For children's health and pregnancy concerns you can check with your local Pediatric Environmental Health Specialty Unit at <http://aoec.org/PEHSU/index.html>. More information for pregnant women can be obtained from the Organization of Teratology Information (OTIS) at www.otispregnancy.org

Suggested further readings:

<http://nj.gov/health/eoh/rtkweb/documents/fs/1183.pdf>

<http://www.atsdr.cdc.gov/MHMI/mmg46.pdf>

<http://www.state.nj.us/health/surv/documents/mercemp.pdf> (Appendix B)

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