Environmental and Occupational Disease Case Reporting and Investigation Protocol
Mercury Poisoning

I. Identification and definition of cases

A. Clinical description

Mercury is a naturally occurring heavy metal that is present in soil, water, and air. Mercury exists as elemental mercury, organic mercury, or inorganic mercury. Clinical effects vary and are dependent on the dose, duration of exposure, the form of mercury, and how the individual was exposed. Upon exposure, mercury can be found throughout the body, including the brain where it may be sequestered for decades. Health effects may be neurological (including tremor, sensory and motor impairments, changes in mood, and cognitive deficits) or renal (impaired kidney function). Because mercury can cross the placenta and is also present in breast milk, infants and children may be exposed as well. In these populations, changes in neurodevelopment may be seen.

Clinical testing

Clinical testing for mercury can be done through either urine or blood. Measurement of total mercury in urine is preferred for inhalational exposures due to elemental mercury vapors while measurements in blood are preferred for dietary exposures to mercury in fish, seafood, or rice.

Common exposures

Mercury exists in multiple forms with different exposures and clinical effects for each.

- **Elemental mercury**: Elemental mercury enters the body primarily through inhalation with ingestion as a secondary exposure route. Exposure to elemental mercury can occur through contaminated air (such as air near a landfill where mercury-containing devices were disposed of), mercury released from amalgam dental fillings, and/or from broken thermometers or other older scientific or medical devices. Inhalation is the primary form of exposure in occupational settings, with dentistry staff and those involved in the chloralkali (chlorinated chemical manufacturing), electronics, fluorescent-lighting manufacturing, and recycling industries being at highest risk.
- **Organic mercury:** The primary exposure to organic mercury occurs through diet, particularly to diets high in fish, seafood, or rice. Contaminated drinking water may also lead to exposures.
- **Inorganic mercury:** Exposure to inorganic mercury by the general public is rare. One exposure source for inorganic mercury is through the use of skin lightening creams.

B. Laboratory criteria

Confirmatory

- Blood mercury levels ≥ 15 µg/L in an **adult** (18 years or older) **or**
- Urine mercury levels ≥ 20 µg/L in an **adult** (18 years old or older) **or**
- Blood mercury levels ≥ 10 µg/L in a **child** (under 18 years old) **or**
- Urine mercury levels ≥ 10 µg/L in a **child** (under 18 years old) **or**
- Urinary mercury:creatinine ratio ≥ 35 (all ages)

C. Wisconsin surveillance case definition

Confirmed case

A case, with or without symptoms, that is laboratory confirmed.

II. Reporting

A. Wisconsin disease surveillance category II – methods for reporting

This disease shall be reported to the patient's local health officer or to the local health officer's designee within 72 hours of recognition of a case or suspected case, per Wis. Admin. Code § DHS 145.04 (3) (b). Report electronically through the Wisconsin Electronic Disease Surveillance System (WEDSS), or mail or fax a completed Acute and Communicable Disease Case Report (F-44151) to the address on the form. If reporting through WEDSS, mercury poisonings are within the under the Metal Poisoning (Non-Lead) section.

B. Responsibility for reporting

According to Wis. Admin Code § DHS 145.04(1), persons licensed under Wis. Stat. ch. 441 or 448, laboratories, health care facilities, teachers, principals, or nurses serving a school or day care center, and any person who knows or suspects that a person has a communicable disease identified in Appendix A.

C. Clinical criteria for reporting

Clinical diagnosis in an adult or child.

D. Laboratory criteria for reporting

Blood mercury levels ≥ 15 µg/L **or** urine mercury levels ≥ 20 µg/L in an **adult or** blood mercury levels ≥ 10 µg/L **or** urine mercury levels ≥ 10 µg/L in a **child or** urinary mercury:creatinine ratio ≥ 35 (all ages)

III. Case investigation

A. Responsibility for case investigation

It is the responsibility of the local health department (LHD) to request the medical records of suspect cases as soon as it is reasonably possible. The medical records should be uploaded into WEDSS. The Bureau of Environmental and Occupational Health (BEOH) performs case investigations unless local health departments choose to conduct routine follow-up for all cases in their jurisdictions. A case investigation may include information collected by phone, in person, in writing, or through review of medical disease report forms, as necessary and appropriate.

B. Required documentation

- Upload medical records for suspect mercury poisoning cases into WEDSS.
- Upon completion of medical record upload, set WEDSS disease incident process status to "Sent to State."

IV. Public health interventions and prevention measures

Local public health should provide routine education to the public on ways to prevent arsenic poisoning, including the following:

- Follow Wisconsin's fish consumption advisories. Also limit consumption of non-Wisconsin fish or seafood that are commonly high in mercury – such as muskie, king mackerel, marlin, orange roughy, shark, swordfish, tilefish, Chilean sea bass, bigeye tuna, and albacore tuna. Information on local

Wisconsin fish advisories can be found on the Wisconsin Department of Natural Resources' (DNR) website.

- Some thermometers contain mercury and can be sources of exposure if the thermometer is broken. Do not vacuum mercury spilled from a broken thermometer. Follow the steps on DHS's mercury cleanup page.
- Skin lightening creams can contain mercury which can be absorbed through the skin. Avoid use of these products, especially those produced outside the U.S.
- If working with mercury in an occupational setting, use personal protective equipment as applicable.

V. Contacts for consultation

- Local health departments and Tribal health agencies: https://www.dhs.wisconsin.gov/lh-depts/index.htm
- Wisconsin Bureau of Environmental and Occupational Health: 608-266-1120 or dhsenvhealth@dhs.wisconsin.gov
- Wisconsin State Laboratory of Hygiene: 1-800-862-1013
- Medical management of mercury poisoning: Wisconsin Poison Control Center: 1-800-222-1222

VI. Related references

- Agency for Toxic Substances and Diseases Registry, Centers for Disease Control and Prevention. (October 2024). ToxGuide for Mercury. Retrieved from www.atsdr.cdc.gov/toxguides/toxguide-46.pdf on December 27, 2024.
- Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention. (October 2024). Toxicological profile for mercury. Retrieved from https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=115&tid=24 on December 27, 2024.
- Environmental Protection Agency. (December 5, 2024). Health effects of exposures to mercury. Retrieved from https://www.epa.gov/mercury/health-effects-exposures-mercury#:~:text=High%20exposure%20to%20inorganic%20mercury,other%20systems%20through%20this%20route. on January 2, 2025.
- Food and Drug Administration. (March 5, 2024). Advice about eating fish. Retrieved from https://www.fda.gov/food/consumers/advice-about-eating-fish#choice on January 3, 2024.
- Minnesota Department of Health. (November 20, 2024). Mercury poisoning from skin lightening products: fact sheet for health care providers. Retrieved from https://www.health.state.mn.us/communities/environment/skin/provfs.html on January 2, 2025.