



Understanding Mercury Exposure Levels

What is mercury?

Mercury occurs naturally in the environment and is also released into the environment through human activity. Mercury occurs in several forms.

- **Elemental mercury** is a silvery, odorless liquid that evaporates slowly at room temperature, becoming a vapor.
- **Inorganic mercury** is mercury combined with other chemical elements such as chlorine, sulfur or oxygen.
- **Organic mercury** is mercury combined with carbon-containing compounds. A common form of organic mercury is methylmercury which is produced by microorganisms in water and soil, and which accumulates in fish.

What medical testing is used to detect mercury exposure?

The most commonly accepted methods of assessing mercury exposure are to test urine or blood.

Both tests usually measure levels of total mercury (elemental, inorganic and organic).

- Elevated mercury in urine usually indicates exposure to an elemental or inorganic source of mercury, such as from a job that uses mercury.
- Elevated mercury in blood usually indicates exposure to organic mercury (such as from eating fish containing methylmercury) or recent exposure to a high level of elemental mercury vapor. For most people, an elevated blood mercury level is associated with eating fish and other seafood containing organic mercury.

Everyone has a small amount of mercury in his/her body. Some people may have higher than usual levels from eating fish and seafood, working with mercury-containing materials, or from other exposure sources.

Why are test results sent to the New York State Heavy Metals Registry?

Healthcare providers and laboratories are required by the New York State (NYS) Sanitary Code to report the results of blood or urine mercury tests to the NYS Department of Health when mercury is at or above the following levels:

- blood - 5 ng/mL (nanograms per milliliter)
- urine - 20 ng/mL

Mercury levels at or above these values do not mean that you will develop adverse health effects. The reporting system is designed to identify workers who might be exposed to mercury so measures to reduce exposures can be taken before health effects are expected.

How can I be exposed to mercury?

- Exposure to elemental mercury most often occurs from breathing air containing elemental mercury vapor. This occurs in some occupations and may also occur when devices containing mercury, such as thermostats or thermometers, break and release mercury droplets and mercury vapor into the air. Small amounts of mercury vapor are also released from dental amalgams (fillings) that contain elemental mercury.
- Exposures to inorganic or organic mercury may come from skin contact with mercury or substances containing mercury (e.g., skin lightening creams), or from use of medicines or vaccines containing mercury.
- Exposure to methylmercury (a form of organic mercury) most often comes from eating fish that contains methylmercury. Usually, greater amounts of methylmercury are found in larger predatory freshwater fish like black bass, walleye and pike, and certain marine fish such as swordfish, shark, king mackerel and tilefish.

What health effects can methylmercury cause?

Whether health effects occur from mercury exposure depends on the amount and form of mercury a person takes in, the route and duration of exposure, and the person's individual characteristics such as age, pregnancy status and general health.

Long-term exposure to high levels of methylmercury causes effects primarily on the nervous system. Symptoms of long-term high level methylmercury exposure include disturbances in vision, hearing and speech, as well as tingling and numbness in fingers and toes, lack of coordination and muscle weakness. Exposure to methylmercury is of particular concern for children and unborn babies because their nervous systems are still developing and may be more vulnerable. Methylmercury consumed by the mother can enter her fetus and can also be passed on in breast milk to nursing infants. In some scientific studies of populations that consume relatively large amounts of seafood, very subtle nervous system effects such as altered memory, attention and language development in children have been associated with increases in exposure to methylmercury in the womb and/or soon after birth.

Scientists do not know precisely what level of mercury in blood may be associated with harmful effects. Some studies suggest that children of mothers with blood mercury levels as low as 30 to 40 ng/ml may exhibit delayed development and subtle nervous system effects during early childhood. Some reports suggest that similar blood mercury levels may be associated with visual, nervous, or cardiovascular system effects in adults. Blood mercury levels above 100 ng/mL have been reported to be associated with clear signs of mercury poisoning in some individuals (e.g., poor muscle coordination, tingling and numbness in fingers and toes).

How can I reduce my blood methylmercury level?

Altering your diet to eat less of the types of fish known to have high mercury levels can decrease your blood mercury level. Many types of fish do not contain high levels of mercury. Eating a variety of different types of fish and shellfish is a good way to gain the nutritional benefits of eating fish while balancing concerns for mercury exposure. Fish are an important part of a healthy diet because they contain high-quality protein, omega-3 fatty acids, and are low in saturated fat, all of which can benefit growth, development and overall nervous system and cardiovascular health.

Information and advice, particularly for marketplace fish such as tuna, swordfish, and shark is available by calling the federal Food and Drug Administration (FDA) consumer food safety hotline (1-800-FDA-4010) or by visiting their website at:

www.epa.gov/fish-tech/epa-fda-advisory-mercury-fish-and-shellfish

NYSDOH issues advisories on eating sportfish taken from New York State waters because some of these fish contain chemicals at levels that may be harmful to health. Many of these advisories are for fish with elevated mercury levels. This information is available by calling 518-402-7800 or by visiting the NYSDOH website at: www.health.ny.gov/fish

If you would like more information on the health effects of mercury or New York State fish consumption advisories, contact the NYSDOH, Bureau of Toxic Substance Assessment at 518-402-7800. For more information on other sources of exposure to mercury, please go to the NYSDOH website at:

www.health.ny.gov/mercury

If you would like more information on exposure to and control of mercury in the workplace, contact the NYSDOH, Bureau of Occupational Health and Injury Prevention at 518-402-7900.