CONDITION

Methylmercury poisoning

Methylmercury poisoning is harmful nervous system damage caused by too much exposure to methylmercury, usually through contaminated food.

WHAT IT IS
Toxic nervous system injury from methylmercury exposure

BODY SYSTEM
Nervous system, including the developing brain

MAIN SYMPTOMS
Numbness, poor balance, vision changes, hearing problems

WHAT CAUSES IT
Toxic exposure, usually contaminated fish or shellfish

HOW IT IS DIAGNOSED
Exposure history and whole-blood mercury testing

MAIN TREATMENT
Stopping exposure, supportive care, specialist-guided chelation

CAN IT BE CURED?
Sometimes - recovery may be incomplete

IS IT AN EMERGENCY?
Sometimes - seizures, severe confusion, or breathing trouble

LONG-TERM OUTLOOK
Early symptoms may improve; major nerve injury can persist

Overview

Methylmercury poisoning happens when enough methylmercury builds up in the body to cause harm. Methylmercury is an organic form of mercury and a powerful toxin for the brain and nerves.

The most common source is fish or shellfish from water contaminated with mercury. Tiny organisms convert mercury into methylmercury. It then builds up through the food chain, so larger, longer-lived predatory fish often contain more than smaller fish.

Methylmercury can cross into the brain. It can also cross the placenta during pregnancy and affect a developing baby's brain and nervous system. A pregnant person may have no clear symptoms even when the fetus has been exposed.

Poisoning is different from having a small amount of mercury detected in the body. Most people have some measurable exposure from food or the environment. A laboratory result must be interpreted alongside the amount and timing of exposure, symptoms, age, and pregnancy status.

Methylmercury poisoning is also different from exposure to elemental mercury, such as mercury vapour from some spills, or inorganic mercury compounds. These forms may affect the body differently and may require different tests.

Symptoms

Symptoms may develop gradually after repeated exposure. There can be a delay of weeks or longer between exposure and noticeable nerve problems.

Possible symptoms include:

Early symptoms can be subtle and may have many other causes. Their presence does not confirm mercury poisoning.

Severe poisoning can cause major difficulty walking, swallowing, speaking, or seeing. Very high exposure may lead to profound confusion, seizures, coma, or breathing problems.

Exposure before birth can affect learning, movement, language, attention, and other parts of development. The effects may not be obvious at birth and can become clearer as a child grows and faces more complex tasks.

- Tingling or numbness, especially around the mouth, hands, or feet
- Poor balance, unsteady walking, or clumsy movements
- Muscle weakness or trouble controlling fine movements
- Tremor
- Slurred speech
- Hearing loss or difficulty understanding speech
- Blurred vision or narrowing of the visual field
- Problems with attention, memory, or thinking

Causes and risk factors

Methylmercury poisoning is caused by taking in more methylmercury than the body can safely

clear. Exposure usually comes from eating contaminated fish or shellfish repeatedly over time.

Risk is influenced by:

Large predatory fish tend to collect more methylmercury because they eat many smaller fish. Mercury levels differ by species, location, and sometimes the size of the fish. Local fishing advisories are especially important for fish caught by family or friends.

Unusual sources have included food contaminated during industrial incidents and grain treated with mercury-containing chemicals and then mistakenly eaten. Workplace or laboratory exposure to organic mercury compounds is possible but uncommon. Many occupational mercury exposures involve other forms of mercury instead.

Dental amalgam fillings contain elemental mercury, not methylmercury. Thimerosal contains ethylmercury, which is processed differently by the body. Concerns about these products should not be assessed using fish-related methylmercury advice.

- The mercury concentration in the food
- How often and how much of it is eaten
- How long the exposure continues
- Age and stage of brain development
- Pregnancy
- Other sources of mercury exposure

Diagnosis

Diagnosis begins with a detailed exposure history. A healthcare professional may ask what fish or seafood you eat, where it came from, how often you eat it, and whether anyone else who shared the food has symptoms. Work, hobbies, cultural remedies, and possible industrial contamination may also be relevant.

A neurological examination checks balance, coordination, strength, sensation, hearing, vision, speech, and thinking.

A whole-blood mercury test is generally the most useful laboratory test for recent or ongoing methylmercury exposure. The result can show that exposure occurred, but it does not perfectly predict whether symptoms will develop or how severe they will be.

Hair testing can sometimes help estimate exposure over a longer period because methylmercury becomes incorporated into growing hair. Collection and interpretation require care. External contamination and unreliable commercial testing can produce misleading

results.

Urine testing is more useful for elemental or inorganic mercury exposure than for methylmercury. Tests performed after taking a chelating drug, sometimes called "provoked" urine tests, do not provide a reliable diagnosis and may lead to unnecessary treatment.

Other tests may be used to rule out conditions that can cause similar symptoms. Hearing, vision, nerve, or developmental assessments may help measure the effects of confirmed exposure.

Treatment and management

The first step is to identify and stop the exposure. This may mean avoiding a particular fish source, following a local contamination notice, or leaving an unsafe workplace until it has been assessed.

Stopping all fish and seafood is not routinely necessary. Fish can provide protein and nutrients that support heart health and fetal development. The goal is usually to replace higher-mercury choices with lower-mercury options, guided by official advice for your location and life stage.

Treatment may include physical therapy for balance and movement, occupational therapy for daily tasks, speech or swallowing therapy, hearing support, and vision rehabilitation. Children exposed before birth may benefit from developmental assessment and educational support.

Chelation is treatment with a medicine that binds certain metals so the body can remove them more easily. It may be considered for significant poisoning, especially when exposure is recent or ongoing. The decision should be made with a medical toxicologist or poison centre because chelation can cause side effects, may not be appropriate for every mercury compound, and has not been shown to reverse established brain injury reliably.

Blood mercury measurements may be repeated to confirm that the level is falling. Symptoms and daily function matter as much as the laboratory number.

Complications

The main complications involve lasting damage to the brain and peripheral nerves, which carry signals between the brain, spinal cord, and the rest of the body.

Possible long-term problems include persistent numbness, poor coordination, restricted vision, hearing loss, weakness, and difficulty speaking or walking. These problems can affect work, driving, communication, and independent daily activities.

Severe poisoning can interfere with swallowing and increase the risk of food or liquid entering the lungs. Major weakness or poor coordination can also increase the risk of falls.

Exposure during fetal development may lead to lasting difficulties with movement, language, memory, attention, or learning. The pattern and severity are not always predictable from the pregnant person's symptoms or blood result alone.

Prevention

Environmental mercury contamination cannot always be prevented by an individual. Personal exposure can often be reduced, however.

Follow national and local advice about fish consumption, especially during pregnancy, while breastfeeding, and for young children. Check local advisories before eating fish caught from lakes, rivers, or coastal waters. Advisories may recommend avoiding certain species or limiting how often they are eaten.

Choose a range of lower-mercury fish rather than relying heavily on one large predatory species. Cooking, rinsing, or trimming fish does not reliably remove methylmercury because it is stored throughout the muscle.

Follow workplace controls if your job involves mercury compounds. Protective equipment, safe handling, and exposure monitoring should be based on the specific form of mercury present.

Do not attempt home detoxification or use chelating products without medical supervision. Some unregulated products may be ineffective or harmful.

Living with it and what to expect

After exposure stops, blood mercury levels usually fall gradually over months. A falling result shows that the body burden is decreasing, but it does not guarantee that nerve symptoms will resolve at the same pace.

Mild sensory or coordination symptoms may improve over months. More serious brain, vision, hearing, or movement injury can be long-lasting or permanent. Recovery is difficult to predict because it is shaped by the dose, duration, timing of exposure, and extent of nerve damage.

Follow-up may include repeat blood testing, neurological examinations, hearing or vision checks, and rehabilitation. Children may need developmental reviews over several years because some learning or attention difficulties only become clear with age.

Many people with mild exposure do not develop poisoning. Those with lasting symptoms may still improve their independence through therapy, mobility aids, hearing devices, workplace adjustments, or school support.

When to get medical help

Seek emergency help now if possible mercury exposure is accompanied by:

Contact a poison centre promptly if you know or suspect that you have eaten food involved in a mercury contamination incident. In the United States, Poison Help is available at 1-800-222-1222 . Elsewhere, use your regional poison information service. Do not wait for symptoms before calling about a known major exposure.

Arrange timely medical assessment for new numbness, balance problems, hearing changes, narrowing vision, or other neurological symptoms after possible repeated exposure.

Routine follow-up is appropriate if you feel well but are concerned about frequent consumption of higher-mercury fish, an abnormal test result, or exposure during pregnancy. A single ordinary seafood meal without a contamination warning is not usually an emergency.

- A seizure, collapse, or loss of consciousness
- Severe confusion or inability to stay awake
- Trouble breathing
- Sudden inability to walk, speak, or swallow
- Rapidly worsening weakness

Common questions

Can one fish meal cause methylmercury poisoning?

Poisoning usually follows repeated exposure or an unusual contamination event, rather than one ordinary meal. If the food is subject to an official warning or several people become unwell, contact a poison centre.

Does cooking fish remove mercury?

No. Methylmercury is held within the fish's muscle and is not reliably removed by cooking, freezing, rinsing, or trimming. Choosing lower-mercury fish is more effective.

Should I stop eating fish during pregnancy?

Usually not. Fish provides important nutrients, but the species and amount matter. Follow

current pregnancy-specific advice from your national food or public health authority and any local fishing advisories.

Will chelation cure mercury poisoning?

Not always. Chelation can increase mercury removal in selected cases, but it may not reverse nerve or brain damage that has already occurred. It also carries risks and requires specialist guidance.

How long does methylmercury stay in the body?

The body removes it gradually, mainly over several months after exposure ends. Continued consumption of a contaminated food can keep the blood level raised. Nerve symptoms may last longer than the mercury level itself.

Is a blood test enough to diagnose poisoning?

A blood test can confirm recent or ongoing exposure, but the number alone does not diagnose the full condition. Symptoms, neurological findings, exposure history, and sometimes follow-up testing are also needed.

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