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## Mercury exposure and poisoning

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### Summary

- There are a number of common sources of mercury in our environment.
  - Certain species of fish, fluorescent and low-energy lamps, mercury-containing thermometers, some batteries and amalgam dental fillings contain some mercury.
  - Preventing or minimising exposure to mercury in your environment is the best way to reduce the risk of mercury poisoning.
  - Pregnant women, infants and children, and people with kidney disease should especially avoid exposure to excess mercury.
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Mercury is a natural substance present in the earth, but it is also produced in various industrial and medical uses. In our environment, the three forms of mercury present are:

- elemental metal – such as in mercury thermometers and dental fillings
- organic compound – mercury is converted by bacteria in the water into methylmercury and this enters the fish food chain
- inorganic compound – naturally present in coal, mercury is released into the air when coal is burned to generate power. mercury is also produced as a waste product in various industrial processes.

The majority of exposure to humans is through organic methylmercury that has entered the food chain and accumulates at higher levels in larger species of fish. The major threat to human health from mercury poisoning is from inhaling mercury as a vapour.

Preventing or minimising exposure to mercury in your environment is the best way to reduce your risk of mercury poisoning.

### Mercury in the environment

There are a number of common sources of mercury in our environment including:

- larger fish species – if eaten in large quantities, these can increase the amount of mercury in your body
- fluorescent and low-energy light bulbs – if broken, there is some risk from inhaling mercury vapour and skin contact with mercury
- mercury thermometers – the pure mercury (or 'quicksilver') from broken thermometers could pose some risk to people if they inhale mercury vapour or have skin contact with mercury
- dental fillings – modern amalgam fillings have a low level of mercury, which is considered safe for most people
- batteries – some batteries contain mercury that can enter the environment if they end up in landfill.

### Reducing exposure to mercury

There are a number of precautions that you can take to minimise your exposure to mercury while also reducing the amount of mercury in our environment.

### Reducing exposure to mercury from fish

Educate yourself about the types of fish that are more likely to contain higher levels of mercury. These include:

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- shark (flake)
- orange roughy
- swordfish
- marlin
- southern bluefin tuna
- gemfish
- ling.

Some freshwater species of fish in Victoria can have high levels of mercury. This is because of Victoria's goldmining history. Goldmining has increased the level of mercury in the sediment of riverbeds, and this means that large brown trout and redfin in the Upper Goulburn and Lake Eildon (and surrounding rivers) may have high levels of mercury.

Most people can still eat fish with higher levels of mercury, but Food Standards Australia New Zealand recommend that they should be eaten less often than fish species with lower levels of mercury. People in high-risk groups (such as pregnant women, children and people with kidney disease) should check the recommendations before eating these fish.

The recommendations for the quantities of fish that can be eaten are different for pregnant women and children compared with the rest of the adult population. Pregnant women, nursing mothers, women planning pregnancy and children up to six years old should avoid fish high in mercury.

Many people take supplements of fish oil to increase their intake of omega-3 fats. While it is better to get your omega-3 fats from fish rather than supplements, if you do use fish oil capsules, check to see if the product has been tested for mercury levels.

### **Reducing exposure to mercury from fluorescent bulbs and lamps**

In 2010, new standards were introduced for low-energy bulbs in Australia. This means that the number of low-energy bulbs has greatly increased and these bulbs contain small levels of mercury. The mercury-containing bulbs include fluorescent tube lamps and the compact low-energy bulbs mostly used in homes.

The amount of mercury in a single bulb or lamp is very small and unlikely to harm people. Commercial and public lighting uses many more lamps and FluoroCycle is a voluntary national scheme to recycle mercury-containing lamps for industrial and public lighting.

For information on lamps used at home, you can contact your local council to find out how best to dispose of light bulbs and lamps.

Broken tubes, bulbs or lamps can be cleaned up as follows:

- Air (ventilate) the room.
- Wear gloves and scoop up all the glass fragments and powder.
- Put all the broken globe or tube into a rigid, sealed container.
- Use sticky tape to pick up any remaining small glass fragments and powder.
- Wipe the area clean with damp paper towels or disposable wet wipes and place them in a glass jar or plastic bag.
- Continue to air the room for 12 to 24 hours.
- Dispose of the mercury and any contaminated items in the rubbish, not in the recycling bin.

### **Reducing exposure to mercury from thermometers and other devices**

Spirit-containing thermometers are now widely available, but some people still use thermometers containing silver mercury. Intact, these are not dangerous, but when broken there is the possibility of inhaling mercury vapour and of

skin contact. These spills should be cleaned up carefully.

The procedure includes the following steps:

- Clear the room of people and pets.
- Air (ventilate) the room for 15 minutes (turn off ducted heating or cooling) before cleaning up.
- Do not use a vacuum cleaner or broom.
- Remove jewellery, wear gloves and wear old clothing that you can throw away.
- Clean up using an eyedropper or syringe to pick up droplets of mercury or use a pen or card to guide the droplets onto a piece of card.
- Use sticky tape to pick up small droplets.
- Place mercury droplets into a strong plastic container with a lid.
- Keep the room ventilated for 24 hours.
- Place any item (including clothes) that came into contact with the mercury into a sealed plastic bag and place in the rubbish.
- Contaminated carpet and other absorbent items will need to be cut out or removed and disposed of carefully.
- More detailed information is available for cleaning procedures.

Other devices around the home can contain more than two tablespoons of mercury. These include thermostats and some medical equipment (such as a sphygmomanometer – to measure blood pressure). Large mercury spills need to be professionally cleaned up. The following steps should be taken:

- Evacuate the area.
- Air (ventilate) the area.
- Contain the spill – call triple zero (000) and ask for fire services.
- Clean up the spill – this should be performed by experienced professionals who specialise in hazardous chemicals.

### **Reducing exposure to mercury from dental fillings**

Dental fillings are used to treat damaged or worn teeth and can be made of amalgam that contains mercury, silver and tin. This substance is used because of its strength, especially in the back teeth that are under a lot of pressure during chewing. Modern amalgam has low levels of mercury and is considered safe for most people.

Alternate materials for fillings that are similar in colour to teeth do not contain mercury but these are not as strong as amalgam. You can replace your amalgam fillings with this material, but it might not last as long, especially in your back teeth. Replacing fillings can also be expensive. Speak with your dentist about your options.

Some people are advised to avoid getting new amalgam fillings and to avoid having existing amalgam removed or replaced if possible including:

- pregnant women – mercury may cross the placenta and enter the bloodstream of the unborn baby
- women who are breastfeeding – mercury may be passed to the baby through breastmilk
- children – growing and developing teeth are more sensitive to the effects of any chemical substances in the environment, including mercury
- people with kidney disease – high levels of mercury exposure can affect the kidneys, so exposure to mercury should be minimised.

While there is currently no scientific evidence directly linking amalgam with either ill health or birth defects, these recommendations have been made for precautionary reasons.

### **Reducing exposure to mercury from batteries**

Not all batteries contain mercury, but those that do can damage the environment if they end up in landfill. Your local

council can give you advice about safe disposal of batteries.

## **People at risk of exposure to mercury**

The effect of mercury exposure depends on the type of mercury. In general, mercury tends to affect the nervous system. This means that unborn babies and children are at more risk because their nervous systems are developing.

People at higher risk from mercury exposure include:

- unborn babies
- infants
- children up to six years of age
- workers in industrial settings where mercury is used or produced
- people with kidney disease
- people born before the 1950s who were exposed to mercury in baby products and contracted pink disease.

Pregnant women should avoid mercury so that it is not transmitted to their unborn baby via the bloodstream. Levels of mercury in breastmilk are normally not high enough to be a risk for babies.

## **Pink disease**

In the first half of the twentieth century, teething powders and other products for babies contained mercury and some babies contracted pink disease. In this condition, the feet, hands and the tip of the nose are bright pink. Other skin problems, diarrhoea and lethargy were also symptoms. Pink disease is now rare, but adults who had pink disease are more sensitive to mercury and may have a number of other health complaints.

## **Symptoms of mercury poisoning**

Symptoms of mercury poisoning depend on the form of the mercury that was the source of the exposure. Early symptoms of mercury poisoning can include a metallic taste in the mouth and numbness and tingling in the hands, feet and face.

## **Symptoms of methylmercury poisoning from fish**

Most people have some methylmercury in their tissues, but these are at a level that not does cause damage. Excess methylmercury particularly affects the nervous symptom. For unborn babies, infants and children this is especially damaging as their brains and nervous systems are developing.

Methylmercury poisoning can cause disturbances in:

- peripheral vision
- sensation, especially on the hands, feet and mouth
- coordination and walking
- speech and hearing
- muscle strength.

## **Symptoms of poisoning from elemental mercury**

This type of poisoning is most likely to occur if there is a spill of mercury from a thermometer or other mercury-containing device. Poisoning is often caused by inhaled mercury vapour, especially in places where there is poor ventilation. Symptoms include:

- tremors
- headaches
- difficulty sleeping
- impaired sensations
- muscle weakness and twitching
- emotional changes (mood swings, irritability, nervousness)
- kidney damage
- breathing difficulties
- death.

### **Symptoms of poisoning from inorganic mercury**

This type of poisoning is more likely to be related to industrial exposure. Symptoms of inorganic mercury poisoning include:

- skin conditions (rashes and dermatitis)
- breathing problems
- mood changes
- problems with memory
- mental health issues
- reduction in muscle strength.

### **Diagnosis of mercury poisoning**

Poisoning from methylmercury can take weeks or months to appear. A chemical spill with elemental mercury or inorganic mercury might give you symptoms more rapidly.

Mercury poisoning is diagnosed by testing your blood and urine for mercury levels. Urine might be collected over a 24-hour period. Your doctor will ask about the history of your possible exposure and may also monitor your temperature, pulse rate, blood pressure and breathing.

If mercury poisoning is suspected, treatment might begin before the diagnosis is confirmed. This is because the test results can take some time to come back to the doctor.

### **Treatment of mercury poisoning**

If mercury poisoning is suspected in people who are critically ill, your doctor will most likely treat you with chelation therapy, no matter what form of mercury caused the poisoning. Chelation therapy is made up of compounds that enter your bloodstream and bind to the mercury so that it can be eliminated by your body.

### **Where to get help**

- Victorian Poisons Information Centre Tel. 13 11 26 – for advice when poisoning or suspected poisoning occurs and poisoning prevention information (24 hours, 7 days)
- Your doctor
- Your dentist
- Detox your Home, Sustainability Victoria Tel. 1300 363 744 – for advice about energy, waste and recycling items such as fluorescent lamps

### **Things to remember**

- There are a number of common sources of mercury in our environment.
- Certain species of fish, fluorescent and low-energy lamps, mercury-containing thermometers, some batteries

and amalgam dental fillings contain some mercury.

- Preventing or minimising exposure to mercury in your environment is the best way to reduce the risk of mercury poisoning.
- Pregnant women, infants and children, and people with kidney disease should especially avoid exposure to excess mercury.

**This page has been produced in consultation with and approved by:**

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