

MANAGING SMALL MERCURY SPILLS

FACT SHEET, OCTOBER 2006

STAY HEALTHY!
STOP MERCURY



Health and Safety Guidance to Minimise Health Risks of Mercury Spills

Mercury can be found in a variety of medical devices. Because it is a powerful neurotoxin, great care must be taken to protect people from spills. The UK Medicinal Healthcare Products Regulatory Agency (MHRA) recommends that, in order to prevent exposure, mercury-free alternative devices should be used wherever possible. Where mercury devices are in use, the agency recommends the maintenance of health and safety measures to deal effectively with spills¹.

This fact sheet should aid hospitals in implementing mercury disposal practices to help minimise the exposure of workers, patients, and the environment to the toxic metal. Many of the recommendations and guidelines on how to effectively deal with mercury spill can be also be used in schools, offices, and private homes. However, the measures outlined below can only be a temporary solution. The best way to eliminate the risks of exposure is to phase out mercury devices in favour of the many safer alternatives available on the market.

Even a small quantity of mercury can lead to mercury poisoning, particularly in children. Healthcare facilities as institutions of healing should phase out mercury devices where safer alternatives are available. Mercury equipment should not be sent home with patients under any circumstance as this increases the risk of mercury contamination in a less controlled environment and exposes a larger number of people to the risk of mercury poisoning.

Case Study of Mercury Poisoning

In 1999 the British Medical Journal² reported a case of a nine year old boy who came to his local hospital with symptoms of abdominal pain, constipation, lethargy, limb pain and unsteadiness. The doctors found out that three months before coming to the hospital, the patient had dismantled a sphygmomanometer in his bedroom. This caused the mercury to spill onto his bed and carpet. He then played with the mercury for a day or two before letting his mother know. The family tried to dispose of the mercury by vacuuming it and even by flushing it down the toilet.

The occupational health department found very high atmospheric concentrations of mercury in the child's bedroom, particularly in the carpet. Doctors at the hospital suspected mercury poisoning and this was confirmed with a blood test that showed serum mercury concentration of 1000nmol/l where the normal reference value is (less than) 30nmol/l.

Apart from detoxification treatment for the patient, the parents had to properly dispose of the vacuum cleaner, bedding, carpets and clothing. A mercury vapour absorbing system had to be installed and used continuously in the room for three months.

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Making a Plan to Avoid Exposure to Mercury:

Implementing safe management procedures for mercury can substantially reduce the risk of unnecessary exposure for patients and staff. It will also minimise the pollution of your facility and ensure that mercury does not enter the ordinary waste stream and pollute the environment around your local community.

1) Education and Training of Staff

Awareness of the hazards of mercury is crucial to maintaining the health and safety onsite. Hospitals around the world have found posters especially useful in educating staff. Annual trainings on identifying mercury sources, managing spills and locating spill kits in the facility also yield positive results. An essential training component should be on appropriate disposal methods for containing devices that are no longer in use or have broken.

2) Maintenance Protocol for Mercury devices

Mercury devices need maintenance, e.g. sphygmomanometers need regular calibration. Spills and exposure are common during maintenance. Simple strategies like working over a tray and covering drains to prevent discharge into wastewater are substantially helpful in preventing mercury from entering the environment.

3) Appropriate Labelling and Collection

Another preventive step to stop mercury from entering the medical waste stream is to label infectious waste and ensure that broken mercury devices do not enter wrong waste streams. It is vital to ensure that waste amalgam, broken equipment and elemental mercury are disposed of in designated boxes in designated areas of the hospital/medical facility or delivered to specific hazardous waste facilities.

4) Mercury Spill Management

Spill kits are essential for the management of mercury spills and breakages. These kits do not have to be very sophisticated or expensive. Each facility should have two or three kits that are replaced once used. Kits need to be used by trained personnel to prevent further exposures and each kit should have clean up instructions that are specific to the hospital/facility. A description of a sample spill kit follows below.

5) Waste Collection Plan

Mercury waste collection plans should have written procedures and responsibilities in case of a spill which also include a spill response procedure. It is vital to prevent the mercury from entering the municipal waste streams. Mercury waste should be disposed of in specific containers and labelled as per the facility's hazardous waste protocol. We recommend finding out from local waste

authorities and health departments how to best dispose of your mercury waste as per the local laws and protocols.

6) Disposal Methods

Mercury is classified and regulated as hazardous waste under EU legislation and has to be treated accordingly. Separate collection schemes are developed in individual countries for mercury collection and recycling. Mercury should be recovered if possible in order to be recycled. This is currently the safest solution and has the added benefits of reducing the amount of mercury ending up in the environment, and decreasing the demand for new raw mercury.

Healthcare facilities should have designated storage spaces for waste mercury. Broken and/or obsolete mercury devices should be placed in separate collection containers along with any spilled mercury from the facility. Your local environment department should be able to give you specific directions on removing mercury waste from your facility.

7) External Management Strategies

Healthcare facilities can negotiate with vendors to take back used and obsolete mercury devices, or find a recycling facility interested in recovering the mercury from disposed products. Hospitals can also negotiate with vendors to phase in mercury-free alternatives where they are available.

Contents of a Spill Kit ³

1. Four to five ziplock-type bags
2. Waste bags (2 to 6 mm thick)
3. Plastic container with lid that seals.
(35 mm film canister for example)
4. Nitrile or latex gloves
5. Paper towels
6. Cardboard strips (index cards for example)
7. Eyedropper or syringe (without needle)
8. Face mask
9. Duct or other sticky tape (30 cm or so)
10. Flashlight
11. Powdered sulphur or zinc (this can easily be obtained at a pharmacy)
12. Set of instructions with waste collection and disposal protocols.

Eleven Step Guide to Cleaning-Up a Mercury Spill

This guide only applies to small spills, such as a broken thermometer. In the event of large spills, turn down the temperature, turn off internal ventilation, open the window, and inform your local health and safety authority.

1. Evacuate area

Remove everyone from the area that has been contaminated and shut the door. Turn off interior ventilation system to avoid dispersing mercury vapour throughout the facility.

2. Put on face mask

In order to prevent breathing of mercury vapour, wear a protective face mask.

3. Put on old clothes

Change into old clothes and shoes that can be discarded if they become contaminated.

4. Remove jewellery

Remove all jewellery from hands and wrists so that the mercury cannot combine (amalgamate) with the precious metals.

5. Wear gloves

Put on rubber or latex gloves. If there are any broken pieces of glass or sharp objects, pick them up with care. Place all broken objects on a paper towel. Fold the paper towel and place in a zip lock bag. Secure the bag and label it as containing items contaminated with mercury. When labelling bags, do so as directed by your local health or fire department to prevent confusion about contents.

6. Identify surface

Wood, linoleum, tile and any other like surfaces can easily be cleaned. Carpet, curtains, upholstery or other such surfaces cannot. These items should be thrown away according to the method outlined below. (For carpets, only the affected portion needs to be cut out and removed.)

7. Locate mercury beads

Locate all mercury beads, then carefully use the cardboard to gather them together. Use slow sweeping motions to prevent accidentally spreading the mercury. Small and hard-to-see beads can be located with the flashlight: hold it at a low angle close to the floor in a darkened room and look for additional glistening beads of mercury that may be sticking to the surface or have gathered in small cracks in the surface. Mercury can move a surprisingly long distance on hard and flat surfaces: be sure to carefully inspect the entire room.

8. Use eyedropper and sticky tape

Use an eyedropper or syringe (without a needle) to draw up the mercury beads.

Slowly and carefully transfer the mercury into an unbreakable plastic container with an airtight lid (such as a plastic film canister). Place the container in a zip-lock bag. Label the bag as containing items contaminated with mercury.

After you remove larger beads, use sticky tape to collect smaller hard-to-see beads. Place the sticky tape in a zip lock bag and secure. Powdered sulphur or zinc stains mercury a darker colour and can make smaller beads easier to see. Be careful not to breathe the powder, as it can be mildly toxic.

9. Leak-Proof Bag

Place all materials used during the cleanup, including gloves, into a leak-proof plastic bag or container. Seal and label it.

10. Final disposal

Contact your local hospital manager responsible for toxic clean up and proper disposal to ensure that all mercury contaminated waste now secured in labelled bags is dealt with in accordance with national and EU legislation.

11. Outside ventilation

Keep the affected area ventilated to the outside (with windows open and ventilation running) for at least 24 hours after your successful cleanup. If sickness occurs, seek medical attention immediately.

“Do not use a vacuum cleaner to clean up a mercury spill.”

Six things you should NEVER do:

1. Never use a vacuum cleaner to clean up mercury: the vacuum cleaner will vaporise the mercury and drastically increase exposure in the area.
2. Never use a broom to clean up mercury: it breaks up the mercury droplets and moves them around, making it harder to decontaminate the area.
3. Never pour mercury down the drain: it can lodge in the plumbing, and contaminate the septic tank and sludge in sewage treatment plants.
4. Never wash mercury-contaminated items in a washing machine: mercury can contaminate the sewage system and the washing machine.
5. Never continue wearing shoes and clothing that might have been contaminated in the mercury spill: this increases the wearer's exposure and helps spread contamination.
6. Never burn shoes, clothing, fabric or anything that has been contaminated with mercury: this puts mercury into the atmosphere.

Resources

Mercury Spill Cleanup Kit.

HCWH factsheet. January 2006. For Global South Countries.
www.noharm.org/details.cfm?type=document&ID=1280

The US Environmental Protection Agency's Clean Up Instructions:

www.epa.gov/epaoswer/hazwaste/mercury/spills.htm

Environment Canada's Cleaning Up Small Mercury Spills:

www.ec.gc.ca/MERCURY/EN/cu.cfm

References

1. MHRA UK (2005) Report of the Independent Advisory Group on Blood Pressure Measurement in Clinical Practice. June 2005. p. 6
2. A C Rennie, M McGregor-Schuerman, I M Dale, C Robinson, R McWilliam (1999) Mercury poisoning after spillage at home from a sphygmomanometer on loan from hospital. *British Medical Journal*. August 7, 1999.
3. Adapted by HCWH from United States Environmental Protection Agency's Guidelines on cleaning up mercury spills. See more at www.epa.gov/mercury/disposal.htm



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* Formerly known as EPHA Environment Network (EEN)

"Stay Healthy, Stop Mercury" campaign

Health and Environment Alliance (HEAL) and Health Care Without Harm Europe (HCWH) are joining forces to mobilise the health community in Europe for a global ban on mercury. The activities are focused on raising awareness of the risks to health, especially for babies and pregnant women, and on working with women and health care professionals on how they can protect themselves and the environment from mercury exposure.

