

Mercury spills in residential settings: background information



Instruments containing mercury, such as thermometers and barometers, are used regularly in the home. Elemental mercury can be hazardous to health, and these instruments are a potential source of exposure. In 2005, of the chemical incidents involving the release of metal reported to the Chemical Hazards and Poisons Division (CHaPD) of the Health Protection Agency (HPA), one in six related to the breakage of a thermometer in a residential property for which clean-up advice was sought [1].

This factsheet is intended to be used as a guide by members of the public who may need to clean up mercury spills resulting from the breakage of a thermometer [2, 3].

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What is elemental mercury?

Elemental mercury (chemical symbol Hg) is a heavy, silvery, liquid metallic element with a relative density thirteen times greater than water [4]. At room temperature, mercury forms globules. Mercury is used in instruments which measure temperature such as thermometers, and in instruments called sphygmomanometers which measure blood pressure (these are commonly used by GPs and nurses), because it is easily visible and has a high boiling point. Typically, thermometers kept in the home contain a few microlitres (one microlitre is one millionth of a litre) of elemental mercury.

Health effects of mercury

- When swallowed, elemental mercury is virtually non-toxic, however, poisoning can occur after inhalation or absorption through the skin.
- Short-term inhalation of mercury vapour causes coughing, breathlessness and chest tightness within a few hours of exposure.
- Short-term inhalation of elemental mercury globules may cause inflammation of the lungs, coughing of blood and difficulty in breathing. However, the likelihood of these symptoms is very rare.
- Short-term exposure of the eyes to elemental mercury vapour can cause inflammation and eyelid tremor.
- Long-term inhalation of elemental mercury vapour may cause damage to the central nervous system, the kidneys and oral cavity, including mouth inflammation, mouth ulcers and sore gums.
- There is no convincing evidence that mercury or mercury compounds can cause cancer in humans.

Exposure to **airborne mercury vapour** at concentrations near 0.05 milligrams per cubic metre (mg m^{-3}) may result in an onset of mild to moderate symptoms. Tremors occur following exposure to airborne mercury vapour at concentrations between 0.1 mg m^{-3} and 0.2 mg m^{-3} . More serious symptoms occur, including chest pains and breathing difficulties, following exposure to concentrations between 1 mg m^{-3} and 40 mg m^{-3} . People exposed to high concentrations of mercury may experience a metallic taste and excessive salivation. The concentrations described above of mercury in air are 1000 to 40000 times greater than that which could be produced from the quantities of mercury released from a broken domestic fever thermometer in a room.

If a thermometer breaks in the mouth, it is possible for children and adults to swallow mercury, but elemental mercury is so poorly absorbed in the gut that it is virtually non-toxic by this route. Inhalation of mercury vapour (which occurs as a result of heating) is much more likely to lead to harmful exposure and is consequently the main health concern [6]. A broken thermometer in the home is unlikely to result in significant exposure to mercury vapours. If a mercury spill is efficiently cleaned up and disposed of correctly the mercury is unlikely to pose a risk to health.

Further information on the health effects of **mercury** is available in the compendium of chemical hazards at www.hpa.org.uk/chemicals/compendium/default.htm [5].

Responding to small mercury spills from a broken thermometer

Members of the public can easily clean up small mercury spills from a broken thermometer on flat and non-porous surfaces. If you estimate that the amount of mercury spilt is greater than the amount in a single thermometer, or if it is difficult to recover all of the spilled mercury, (e.g. if it has penetrated into a carpet) then the contaminated area should be isolated and the environmental health department of your local authority should be contacted.

Prevention of accidents involving mercury

Glass alcohol and digital electronic thermometers are now widely available. Broken thermometers should be replaced with non-mercury alternatives and they should be disposed of as hazardous waste at the local recycling facility. For further information about this, contact the environmental health department of your local authority.

The European Parliament recently supported a draft directive (76/769/EEC) which will prohibit the sale of non-electrical devices containing mercury which will include mercury thermometers [7,8]. This legislation will not affect those devices already in use or those which have already been placed on the market.

Health professionals using medical devices containing mercury should refer to the Medicines and Healthcare Products Regulatory Agency (MHRA), who have provided further guidance.

Further information on hazardous waste collection in your area can be obtained from the Directgov website at local.direct.gov.uk/LDGRedirect/index.jsp?LGSL=850&LGIL=8&ServiceName=Find%20out%20about%20hazardous%20waste%20collection.

References

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