Preventing and managing small mercury spills in health care facilities: Best practices

1 Prioritize prevention

- Phase out use of mercury-containing products and replace with mercury-free products, such as digital thermometers and sphygmomanometers.
- Store mercury-containing devices in sturdy, sealed, impact-resistant containers and place in cool, well-ventilated areas. Temporary storage areas should be away from heat sources and at a distance from zones with frequent staff or patient movement. Temporary storage areas should meet local hazardous medical waste regulations.
- Clearly label all containers holding mercury in accordance with the United Nations "Globally Harmonized System of Classification and Labelling of Chemicals"[1] and the relevant Safety Data Sheet to prevent accidental mishandling.
- Periodically check the condition of mercury-containing medical devices to ensure they are not damaged.
- Restrict access to areas where mercury is stored to trained personnel only.
- Keep mercury spill kits (see Annex for details) readily available in all health care facilities with mercury containing devices and with written instructions for the correct spill-response procedure.
- Maintain a spill-risk map in all health care facilities identifying all locations where mercury-containing devices are used or stored.
- Ensure that all staff receive appropriate occupational safety and health training, including on handling of hazardous substances and emergency response procedures, as required by national regulations.
- Designate and train specific personnel responsible for mercury spill response. Their names and contact information should clearly visible and accessible to all staff.

2 Spillage control steps

The following outlines the steps to prepare for and safely clean-up a spillage. The risks posed by a spill will depend on many factors including the amount of mercury spilled, where it is spilled and how the spill is managed. Small health care facilities in resource-constrained settings may not have all the recommended equipment and personnel. At a minimum, personal protection (filtering-facepiece respirator, gloves) for those cleaning spills must be available along with materials to safely bag, package and store spilled mercury. Facilities should continuously work to keep staff and all users of the health care facility safe and protected from any potential exposure to mercury.

2.1. Availability of mercury spill kit

All health care facilities where mercury products are in use or stored must have a mercury spill response kit and appropriate personal protective equipment (PPE). Health and care

[1] In 2003, the United Nations (UN) adopted the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The GHS includes criteria for the classification of health, physical and environmental hazards, as well as specifying what information should be included on labels of hazardous chemicals as well as safety data sheets. More information can be found here: Globally Harmonized System of Classification and Labelling of Chemicals (GHS Rev. 9, 2021) | UNECE

workers must be trained in the correct use of PPE (see Annex). The number of kits required will depend on the size of the facility and amount of mercury products used. Priority areas within the facility—such as waste storage zones, laboratories, and clinical departments where mercury-containing devices are handled— should be identified and mercury spill kits should be placed in these locations.

Once a kit is used it must be immediately replaced or refilled. Kits need to be used by trained personnel to prevent further exposure, and each kit should have clean-up instructions specific to that facility. Kit contents should be inspected at least quarterly or as required by national occupational health and safety regulations, regardless of whether the kit has been used.

2.2 Preparing for cleaning up spills

- Evacuate the spill area: before people leave, ensure that their shoes, clothing, and other articles have not been contaminated with mercury.
- Collect mercury spill kit.
- Accident remediation should always be carried out by two trained personnel working in pairs—one performing the clean-up following written instructions and one assisting and monitoring safety.
- Personnel designated for cleanup must put on the appropriate PPE before re-entering the contaminated area.
    - Nitrile gloves (not latex which can be permeable to mercury vapour)
    - Filtering facepiece respirator[2]
    - Eye protection (e.g. non-vented safety goggles) where splashing may occur
    - Coveralls with long sleeves.
- Assess and isolate: quickly determine the affected area and close the room . Secure the area (use barrier tape or cones if necessary) and restrict admission to only those persons necessary to clean up the spill. Block off foot traffic within a minimum 2 meter radius of the area.
- Place clear, visible warning signs or notices on all entry points (barrier tape, doors, entrances) to the affected area. The signs can include: "DANGER: Mercury Spill – Authorized Personnel Only".
- Close the room and restrict access to prevent mercury vapour and droplets from spreading to other areas.
- Ventilate the area by opening windows but do not use mechanized ventilation as this may spread mercury vapour in the ventilation system and throughout the facility. If the size of the spill is considerable, consider turning off the interior ventilation systems immediately (if available) to avoid dispersing mercury vapour in the ventilation system and throughout the facility. In addition, for large spills turn off all heating and air conditioning (if available) immediately in the affected area (note that mercury vapour rise with heat).

[2] For small spillages a N95 respirator or FFP2 that filters at least 94% of airborne particles 0.3 microns in diameter can be used. These does not offer protection from mercury vapor but supports general respiratory health. If the amount of mercury spilled is considerable (e.g. many thermometers, large amount of mercury in a stored area) or it is spilled into cracks/porous surfaces, an elastomeric half-mask or full face piece respirator equipped with a metallic-mercury vapor cartridge is recommended (e.g. HgP3 cartridge in accordance with EN 14387, US OSHA 1910.134, National Institute for Occupational Safety and Health (NIOSH)-approved under 42 CFR 84).

2.3 Removal of mercury and contaminated materials

Packaging (refer to Figure 1)

- Container A for spilled mercury should be rigid, vapour-tight and non-permeable (i.e. high density polyethylene [HDPE]) or stainless steel.
- Each of the disposal bags (B and C) should be sturdy, non-permeable (i.e. HDPE) and sealable.
- **Liquid mercury beads and glass (sealable air tight container A)**
    - Carefully push beads together using cardboard sheets or playing cards.
    - Use an eyedropper or syringe to suck up the beads and place them into the sealable air tight container (A)
    - Use tweezers for glass pieces and put them into the same container (A).
    - Close container A to prevent mercury vapour escape and accidental puncture.
    - Place the tweezers into sealable plastic bag B (see below) after use.
- **Non liquid or sharp mercury-containing waste (sealable plastic bag B)**
    - Use a flashlight at a low angle to spot beads as they reflect light. Use sticky tape to pick them up and place them into bag B.
    - Apply sulphur powder or amalgamating powder (e.g. copper or zinc) over the spill and avoid sprinkling powder from a height to prevent dust clouds. Gently rub with a damp paper towel; this chemically binds mercury (amalgamates it). Always avoid inhaling sulphur dust.
    - Clean the area with damp paper towels and place the contaminated materials into bag B.
    - Seal plastic bag B with a zip tie or strong tape.
- **Used PPE (bag C)**
    - Remove PPE using appropriate doffing procedures and place them into bag C.
    - Seal plastic bag C (zip tie or strong tape).

Secondary packaging

- Place the closed primary packaging, which includes the airtight plastic container (container A) and the sealed plastic bags (bag B and bag C) into the labelled larger plastic bag (secondary packaging).
- Seal the secondary packaging bag with strong tape.
- Label the secondary plastic bag with: “Hazardous mercury waste” including the date of collection, location within the facility, and signature of the person responsible for collection.
- Seal secondary bag with a marking “Do not open”.

Transport and interim storage

- The entire package (secondary packaging containing primary packaging, bag B and bag C) should be transported to the designated interim storage area or handed over to authorized hazardous waste facilities—never dispose of them with regular health care waste or with general waste.

- The location of the interim storage area and contact details of authorized hazardous waste facilities should be clearly identified in the facility's waste management plan and communicated to all relevant staff.

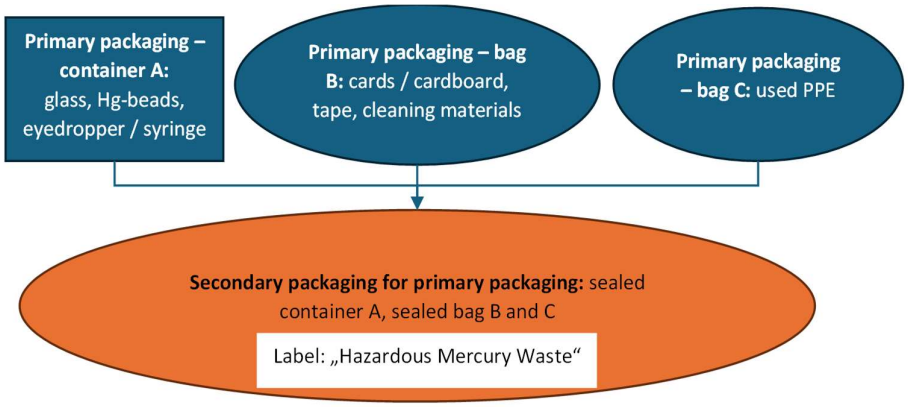

Figure 1. Packaging spilled mercury

Specific procedures for bed sheets, clothing and carpets:

- If the spill has occurred on bed sheets or clothing, these should be double bagged and labelled for disposal. Do not wash or reuse contaminated fabrics.
- If a carpet has been contaminated with mercury, do not shake, sweep or vacuum it. Cut out the affected area, double bag it, and label it for disposal.

2.4 Personal decontamination after cleaning up

- Wash hands, forearms and all exposed skin thoroughly with soap and running water.
- Ensure that first aid is available on-site, and that workers at risk of mercury exposure are included in appropriate occupational health surveillance and medical monitoring programs.

2.5 Ventilate and monitor

- Continue ventilation of the area for several hours (and up to 48 hours) to reduce residual vapour.
- If a mercury vapour detector is available, verify that mercury vapour levels comply with national regulatory limits where applicable, or with recognized occupational exposure limits before reuse.[3]
- During extended ventilation, display clear warning signs indicating "Mercury Spill" to alert personnel.

2.6 Report and document

- Inform the person responsible for waste management in the facility to organize pick up of the waste.
- Follow internal incident reporting protocols. All mercury or hazardous waste spill incidents must be documented using designated spill/accident report forms and submitted to the relevant unit (e.g. occupational health and safety, patient safety) or for further investigation and follow-up.

[3]

- Where applicable, health and care workers should be informed of their exposure and may require medical follow-up depending on level of contamination.

3 Don’ts (critical warnings)

- Do not vacuum or sweep – this can aerosolize mercury.
- Do not wash contaminated clothing; it must be discarded.
- Do not touch mercury with bare hands.
- Do not pour mercury down drains.
- Do not mix mercury-contaminated waste with other waste.
- Do not dispose of mercury or mercury-contaminated materials in regular waste, open pits, or any location other than the designated interim storage area or authorized hazardous waste facilities.
- Do not assign pregnant or breastfeeding staff to mercury spill response activities.
- Do not use sodium hypochlorite (bleach or chlorine) cleaners near mercury as this can form mercuric chloride which is toxic.

ANNEX

1. Spillage kit content

	Item	Quantity
	Step-by-step laminated spillage control instructions	1 sheet
PPE	Nitril gloves	2 pairs
	Respirator masks	2
	Safety goggles	2
	Disposable coveralls	2
	Shoe covers	2 pairs
	Warning plate/sign: "DANGER: Mercury Spill – Authorized Personnel Only"	1
Packaging material	Etc.	

- Step-by-step laminated spillage control instruction sheet.
- PPE
    - 2 pairs nitril gloves
    - 2 respirator masks (N95 or FFP2)
    - 2 safety goggles
    - 2 disposable coveralls
    - 2 pairs shoe covers
    - 1 warning plate or sign "DANGER: Mercury Spill – Authorized Personnel Only"

- Packaging material
    - 1 rigid vapour-tight, non-permeable container for collecting mercury beads and broken glass (container A)
    - 1 thick sealable, non-permeable plastic bag for syringe, tweezer, playing cards/cardboard and cleaning materials (bag B; preferably HDPE)
    - 1 thick sealable, non-permeable plastic bag for used PPE and clean-up materials (bag C; preferably HDPE)
    - 1 large (e.g. 20 litres) strong plastic bag for secondary packaging to be sealed with duct tape and labelled
    - Label: Hazardous Mercury waste or permanent marker pen for writing on the secondary bag.

- Cleaning material
    - 1 small plastic shovel and spatula
    - 1 plastic pipette or syringe
    - 1 pair of plastic tweezers
    - 1 flashlight/torch
    - 1 roll of duct tape
    - Sulphur powder/amalgamating powder (copper/zinc)
    - Set of absorbent paper towels
    - 2 floor warning signs with pictograms according to Globally Harmonized System of Classification and Labelling of Chemicals showing “Caution! Mercury Hazard”.

2. Additional resources

Mercury and human health: education course. Bonn: World Health Organization Regional Office; 2021). https://iris.who.int/items/86a90bb7-aa2a-4ff4-b500-aab148727bd8cury and human health: educational course (accessed 9 January 2026).

WHO Mercury and health factsheet. Geneva: World Health Organization; 2024. https://www.who.int/news-room/fact-sheets/detail/mercury-and-health; accessed 9 January 2026).

Exposure to Mercury in the World of Work: a review of the evidence and key priority actions. Geneva: International Labor Organization;2022. (https://www.ilo.org/publications/exposure-mercury-world-work-review-evidence-and-key-priority-actions-0; accessed 9 January 2026)

International Chemical Safety Card (ICSC) 0056-Mercury. Geneva: International Labor Organization and World Health Organization. ICSC 0056 https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0056&p_version=2- MERCURY (accessed 9 January 2026).

Caring for those who care; Guide for the development and implementation of occupational health and safety programs for health workers. Geneva: World Health Organization and International Labor Organization; 2022 (https://iris.who.int/handle/10665/351436; accessed 9 January 2026).

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