

Medical Waste Management

While supporting any form of medical intervention, logistics personnel may be asked to manage a variety of medical waste. Medical waste isn't defined as just the health items that are found as damaged or expired while in storage or transport, but also the byproduct of routine activities that occur in health centres and hospitals as well.

Waste categories	Descriptions and examples
Hazardous health-care waste	<p>Infectious waste</p> <p>Waste known or suspected to contain pathogens and pose a risk of disease transmission, e.g. waste and wastewater contaminated with blood and other body fluids, including highly infectious waste such as laboratory cultures and microbiological stocks; and waste including excreta and other materials that have been in contact with patients infected with highly infectious diseases in isolation wards.</p>
	<p>Sharps waste</p> <p>Used or unused sharps, e.g. hypodermic, intravenous or other needles; auto-disable syringes; syringes with attached needles; infusion sets; scalpels; pipettes; knives; blades; broken glass.</p>
	<p>Pathological waste</p> <p>Human tissues, organs or fluids; body parts; fetuses; unused blood products.</p>
	<p>Pharmaceutical waste, cytotoxic waste</p> <p>Pharmaceuticals that are expired or no longer needed; items contaminated by, or containing, pharmaceuticals. Cytotoxic waste containing substances with genotoxic properties, e.g. waste containing cytostatic drugs (often used in cancer therapy); genotoxic chemicals.</p>
	<p>Chemical waste</p> <p>Waste containing chemical substances, e.g. laboratory reagents; film developer; disinfectants that are expired or no longer needed; solvents; waste with high content of heavy metals, e.g. batteries, broken thermometers and blood pressure gauges.</p>
Non-hazardous or general health-care waste	<p>Radioactive waste</p> <p>Waste containing radioactive substances, e.g. unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources.</p>
	<p>General waste</p> <p>Waste that does not pose any specific biological, chemical, radioactive or physical hazard.</p>

Taken from: [WHO - Safe management of wastes from health-care activities](#)

Medical waste can pose specific threats to humans, animals and the environment, and must be handled appropriately. Infectious waste and pathological waste products in particular are highly sensitive and should only be handled by experts that understand the process, while all of the aforementioned medical waste items are likely subject to some form of regulation or control.

International conventions such as the [Basel Convention on the Control of Transboundary](#)

[Movements of Hazardous Wastes](#) or the [Stockholm Convention on Persistent Organic Pollutants \(POPs\)](#) in particular define the waste management policies for signatories, however national or local laws may will also outline the procedures. The important thing for logistics personnel to know that that any form of medical waste disposal must be done in a safe and lawful manner. Under no circumstances should medical waste be disposed of with general waste.

Traditionally, the aggregation and storage of medical waste is not the role of logistics personnel and is usually left to healthcare professionals operating in medical facilities. Due to limitations on personnel and resources, logistics staff in humanitarian fields settings may be required to facilitate the handling, storage or transport of medical waste.

Segregation of Medical Waste

Though local conditions may vary, as a best practice healthcare facility should segregate waste into four categories, each of which should be stored, collected and disposed of separately. The four categories are:





1. Sharps waste (needles and scalpels, etc.), which may or may not be infectious.
2. Non-sharps infectious waste (anatomical waste, pathological waste, dressings, used syringes, and used single-use gloves, etc.).
3. Non-sharps non-infectious waste (paper and packaging, etc.).
4. Hazardous waste (expired drugs, laboratory reagents, radioactive waste and insecticides, etc.).

Almost 85% of medical waste in health centers or hospitals belong to the category of non-sharps non-infectious waste. Any waste item that is cross-contaminated with infections waste should be considered infections waste as well, and proper segregation of non-sharps non-infectious waste from infectious waste can significantly reduce the total amount of infectious waste in a health facility. However, in many humanitarian contexts hazardous and non-hazardous healthcare waste is often not separated. If proper segregation cannot be ensured at source, consider all mixed healthcare waste as hazardous.

Medical Waste Collection

Collection and storage of medical waste must be done using suitable storage containers. If no suitable containers are available, humanitarian organisations are strongly advised to procure the appropriate storage containers. As hazardous waste is collected, each container should be properly labelled, and collected waste should be placed in a pre-defined, secure location.

WHO has recommended coding and storage for some medical waste storage, including symbols, colour coding and marking. Recommendations for some common medical waste items are:

Type of waste	Colour coding	Symbol	Type of container
Household refuse (non-sharps non-infectious waste)	Black	None	Plastic bag
Sharps	Yellow and marked with a biohazard symbol:		Sharps container
Waste entailing a risk of contamination and anatomical waste	Yellow and marked with a biohazard symbol:		Plastic bag or container
Infectious waste	Yellow marked "highly infectious" and marked with a biohazard symbol:		Plastic bag or container which can be autoclaved
Chemical and pharmaceutical waste	Brown, marked with a suitable symbol (example)		Plastic bag, container

Adapted from: [ICRC - Medical Waste Management Guidelines](#)

Common storage container examples and practices include:

- Sharps should be placed immediately after use in yellow puncture-proof, covered safe sharps containers, which are regularly collected for disposal. Containers must not be filled above the line indicated on the label, and they must be sealed using the integrated safety lock prior to disposal.
- Non-sharps infectious waste should be placed in yellow or red infectious waste bags or containers (15–40-litre capacity with lids). Bags should be collected and replaced after each intervention or twice daily. Containers should be emptied, cleaned and disinfected after each intervention or twice daily.
- Non-sharps non-infectious waste should be placed in black waste containers (20–60 litre capacity). The containers should be collected, emptied, cleaned and replaced daily; alternatively, plastic bags may be used as liners inside the containers.

Adapted from: [WFP Logistics Cluster - Downstream Logistics in Pandemics](#)

For each of these three waste categories, it is recommended that waste containers are kept no more than five metres from the point of waste generation. Two sets of containers should be provided for each location, for a minimum of three types of waste, or as is required by the

activities in the health facility. In hospital wards, at least one set of waste containers should be provided per 20 beds.

Example Sharps Container

Example Biohazard Bag



Personal Protective Equipment:

Any persons tasked with collecting and handling medical waste should have the proper and necessary personal protective equipment (PPE). This may include protective eyewear, rubber gloves, aprons, respirators, and the proper body covering. Prior to handling any and all medical waste, personnel should consult with the attending medical staff about the appropriate handling protective equipment. Remember: some health related waste can be extremely hazardous or even lethal if handled incorrectly. If ever logistics personnel are in doubt about the safety of handling medical waste, they should cease activities and consult with a trained professional.

Medical Waste Storage

The storage of medical waste can and will be regulated by prevailing local and national laws. Humanitarian organisations may also have internal guidelines or regulations on storage of medical waste. As an overall rule, humanitarian responders must check on local regulations before designing storage options. Medical waste should also be handled by experienced professionals when and wherever possible. Below are general best practices that *may* be adopted if needed:

General non-hazardous waste storage

General non-hazardous waste should be stored and kept for collection to recycle (where possible), dispose at a communal landfill/dumpsite, or as a last resort destroyed at communal waste incinerator. It should be collected at least every week. The storage area should be enclosed, paved and connected to a public road. The gate should be big enough that the collection vehicles can enter. If available in the location, non-hazardous cardboards, metals, plastics, paper can be sorted and recycled by local contractors and avoid the need for disposing of in landfills or incineration.

Infectious and sharp waste storage	<p>The storage place must be identifiable as an infectious waste area by using the biohazard symbol. Floors and walls should be sealed or tiled to allow easy cleaning and disinfection. Storage times for infectious waste (e.g. the time gap between generation and treatment) should not exceed the following periods:</p> <ul style="list-style-type: none"> • Temperate climate: 72 hours in winter/48 hours in summer. • Warm climate: 48 hours during the cool season/24 hours during the hot season. <p>If a refrigerated storage room is available, infectious waste can be stored for more than a week cooled to a temperature no higher than 3°C to 8°C.</p>
Pathological waste storage	<p>Pathological waste is considered biologically active and gas formation during the storage should be expected. To Minimise the possibility of this happening, storage places should have the same conditions as for infectious and sharps wastes. Where possible, waste should be stored under refrigerated conditions. In some cultures, body parts are passed to the family for ritual procedures or are buried in designated places. Bodies should be placed in sealed bags prior to release to the family to reduce the risk of infection.</p>
Pharmaceutical waste storage	<p>Pharmaceutical waste should be segregated from other wastes. International and local regulations should be followed for storage. In general, pharmaceutical wastes can be hazardous or non-hazardous, liquid or solid in nature and each type should be handled differently. The classification should be carried out by a pharmacist or other expert on pharmaceuticals.</p>
Storage of other hazardous waste	<p>When planning storage places for hazardous chemical waste, the characteristics of the specific chemicals to be stored and disposed of must be considered (i.e. inflammable, corrosive, explosive). The storage area should be enclosed and separated from other waste storage areas. Storage facilities should be labelled according to the hazard level of the stored waste.</p>
Radioactive Waste Storage	<p>Radioactive waste should be stored in compliance with national regulations and in consultation with the radiation officer. It should be placed in containers that prevent dispersion of radiation and stored behind lead shielding. Waste that is to be stored during radioactive decay should be labelled with the type of radionuclide, date, period of time before full decay and details of required storage conditions.</p>

Taken from: [WHO - Safe management of wastes from health-care activities](#)

Treatment and Disposal

The process for safe and adequate disposal of pharmaceuticals and health related items in

contexts where humanitarians may operate has evolved significantly over the past several decades. Many state and local authorities now have strict regulations on the process of disposing of health waste and may include requirements far beyond the capacities of most individual humanitarian organisations.

As a primary rule, aid agencies should seek to outsource the destruction of medical waste to licensed and recognised third parties, including private companies, or through state managed entities such as local Ministries of Health. Aid agencies should also seek to understand and respect all local laws wherever applicable. Proper disposal usually has a cost associated with it, and organisations should budget for potential disposal costs.

In any situation where waste is disposed of using a third party, or by the organisation following national protocols or WHO guidelines (subject to regulatory framework), proper documentation must be retained and backed up to prove disposal was undertaken in a lawful manner. Even where disposal is done informally in large scale emergencies, the process must be documented to avoid the suspicion of diversion or health related items, or to avoid the suspicion that expired, damaged, or recalled items were handed out to beneficiaries, or sold illegally.

The [Logistics Capacity Assessments](#) website can provide humanitarian organizations with contact details for licensed waste management companies, overviews on local regulations and procedures in country including medical waste, and lists the existing waste management and recycling facilities in country.

In extraordinary situations, humanitarian organisations might be required to dispose of their own medical waste. Some steps might include:

- Sharps should be disposed of in a sharps pit. In small health centres or emergency structures, sharps pits may simply be buried drums; in other settings, they might be concrete-lined pits. For safety reasons, it is not advisable to use a decentralized facility to handle collection and off-site treatment and disposal. However, in urban situations this may be unavoidable due to lack of space.
- In small healthcare settings, non-sharps infectious waste should be buried in a pit fitted with a sealed cover and ventilation pipe for on-site treatment. Alternatively, it should be high temperature incinerated or steam sterilized either on-site or off-site. Special arrangements may be needed to dispose of placentas according to local custom. The preferred option for specific infectious waste (such as blood samples, plastic syringes and laboratory tests) is steam sterilization before disposal. This avoids environmental pollution from incineration. One autoclave should be dedicated for waste sterilization. The autoclave used for sterilizing medical devices within the laboratory must not be used for this purpose.
- Non-sharps non-infectious waste should be buried in a pit, a landfill site, or preferably recycled with non-food and non-medical items. If space is limited, non-sharps non-infectious waste should be incinerated. Ashes and residues should be buried in a pit.
- There are several kinds of hazardous waste, and each requires specific treatment and disposal methods. These include encapsulation, sterilization, burial, incineration and long-term storage. Some waste, such as pharmaceutical waste, cannot be disposed of in low-cost settings and should be sent to a large centre for destruction or returned to the supplier. In all cases, national regulations should be followed.

Waste Disposal Zones

In locations where agencies must dispose of their own medical waste there are basic guidelines on the physical locations for disposal.

- The waste disposal zone should be fenced off and should be located at least 30 metres from groundwater sources.
- It should have a water point with soap or detergent and disinfectant for handwashing or to clean and disinfect containers, and it should have facilities for wastewater disposal into a soakaway system or sewer.
- Where an incinerator is used, it should be located to allow effective operation with minimal local air pollution in the health centre, nearby housing and crops, and it should be large enough for extension if new pits or other facilities have to be built.

WHO has published guidelines on the [safe disposal of unwanted pharmaceuticals](#) including strategies for prevention, reusing, returning and safe disposal, in and after emergencies, and the [safe management of wastes from health-care activities](#). In the event that agencies must dispose of their own medical waste, they are encouraged to speak with local Ministries of Health or other relevant body and consult with representatives from the local health cluster if available.