



TECHNICAL FACT SHEET 4

Safe and sustainable health care waste management

As part of broader water, sanitation and hygiene (WASH) and infection prevention and control (IPC) efforts, safe and sustainable management of health care waste reduces health care-associated infections; increases trust in, and uptake of, services; reduces harm to the environment and nearby community; and decreases cost of service delivery. In least developed countries, health care waste management is often an underfunded and neglected area within the health service. Seven out of 10 health care facilities in least developed countries lack basic health care waste management services. Excess waste volumes and improperly managed health care waste cause plastic contamination in the environment, air pollution through burning, and wasted resources in unnecessary excess packaging and personal protective equipment (PPE). They can also pose a danger to patients, staff (including waste handlers) and surrounding communities.

Waste management considerations within the Water and Sanitation for Health Facility Improvement Tool (WASH FIT) cycle

Step	Activity	Additional considerations
Preparation	Develop or review safe and sustainable health care waste management (HCWM) plans for the facility, which include an outline of responsibilities, waste processes, training, monitoring and the annual budget (investment and operational costs) needed for interventions. Factor in the ongoing need for associated PPE, hand hygiene supplies and vaccinations for staff.	Update the facility HCWM plan annually, considering incremental improvements towards more sustainable waste management, including procuring items with less packaging and more environmentally sustainable packaging, ensuring rational use of PPE (e.g. reducing unnecessary glove use, use of foot covers when not prescribed) and recycling waste.
Step 1: Establish the team	Identify a member of staff who is responsible for waste management. The WASH FIT and waste management teams should include expertise in IPC; cleaning; and medical and technical services needed to plan, implement and monitor safe and sustainable HCWM practices. Finance and procurement staff should support the HCWM team. The HCWM team can be part of the existing IPC team.	Seek input from external waste or environmental experts when needed.
Step 2: Assess the facility	Assess waste-specific activities from waste generation to final disposal (segregation, transport, storage, treatment and disposal). Consider the knowledge, practices and awareness of staff; the need to use only appropriate and not excess PPE; the potential for recycling; and the use of environmentally sustainable waste treatment technologies.	Where waste is treated off-site, understand where waste is being taken, and how it is being transported and treated. Ensure that it is done safely, and according to national and international standards.
Step 3: Risk assessment	Possible risks to staff, patients and the community linked to unsafe HCWM include exposure to infectious agents or other hazardous materials in the waste, needlestick injuries during waste handling, contamination of water supplies and the surrounding environment, and production of toxic gases and pollutants. Plan for mitigation measures to lower the risk.	Elimination of risk is the priority of the risk reduction strategy. For example, procure items with less packaging (e.g. avoid single wrapped and plastic packaging when possible), procure PPE that is safe and incorporates renewable or biobased materials, and improve treatment by reaching high burn temperatures and/or using environmentally sustainable waste treatment technologies to eliminate environmental pollution resulting from burning of waste.

Step	Activity	Additional considerations
Step 4: Develop and implement improvement plan	<p>Reinforce safe and sustainable HCWM protocols, and prioritize quick wins and changes that facilities can make easily. Examples are reduction of waste by appropriate use of PPE (e.g. gloves are not used when not needed, such as during vaccination procedures or measurement of a patient's temperature), introduction of recycling, regular monitoring of infectious waste volumes, safe waste segregation at the place of generation, separate transport and storage of hazardous and non-hazardous waste, regular collection and disposal of non-hazardous waste, and safe treatment of infectious and sharps waste. Plan for regular staff training, mentoring and awareness-raising activities.</p> <p>Waste infrastructure and equipment should be available and regularly maintained. There should be sufficient budget for operation of equipment (e.g. incinerator, autoclave) and disposables (e.g. waste bags).</p>	<p>Quick wins can be highlighted on a chart that is visible to all staff. Track progress regularly (at least weekly) towards addressing these. Recognize when quick wins have been achieved through awards, staff meetings and small parties.</p> <p>Consider incremental improvements towards safe and sustainable HCWM, such as initiating environmentally sustainable procurement, recycling, and using centralized incineration or alternative non-burn technologies for treatment of infectious and sharps waste.</p>
Step 5: Monitor, review, adapt, improve	<p>Sustainable waste treatment technologies are available and should be considered for incremental improvements. A long-term strategy, including waste reduction and investment in system upgrading, should be developed to supplement and guide annual HCWM plans. This may require engagement and coordination with central or district medical supply entities to procure items with more biobased or renewable materials, safe and reusable PPE, and less packaging and more environmentally sustainable packaging.</p>	<p>Regularly discuss new products, innovations, technologies and practices with waste, environment and WASH experts at national and international levels. Consider how to adapt these to the facility.</p>

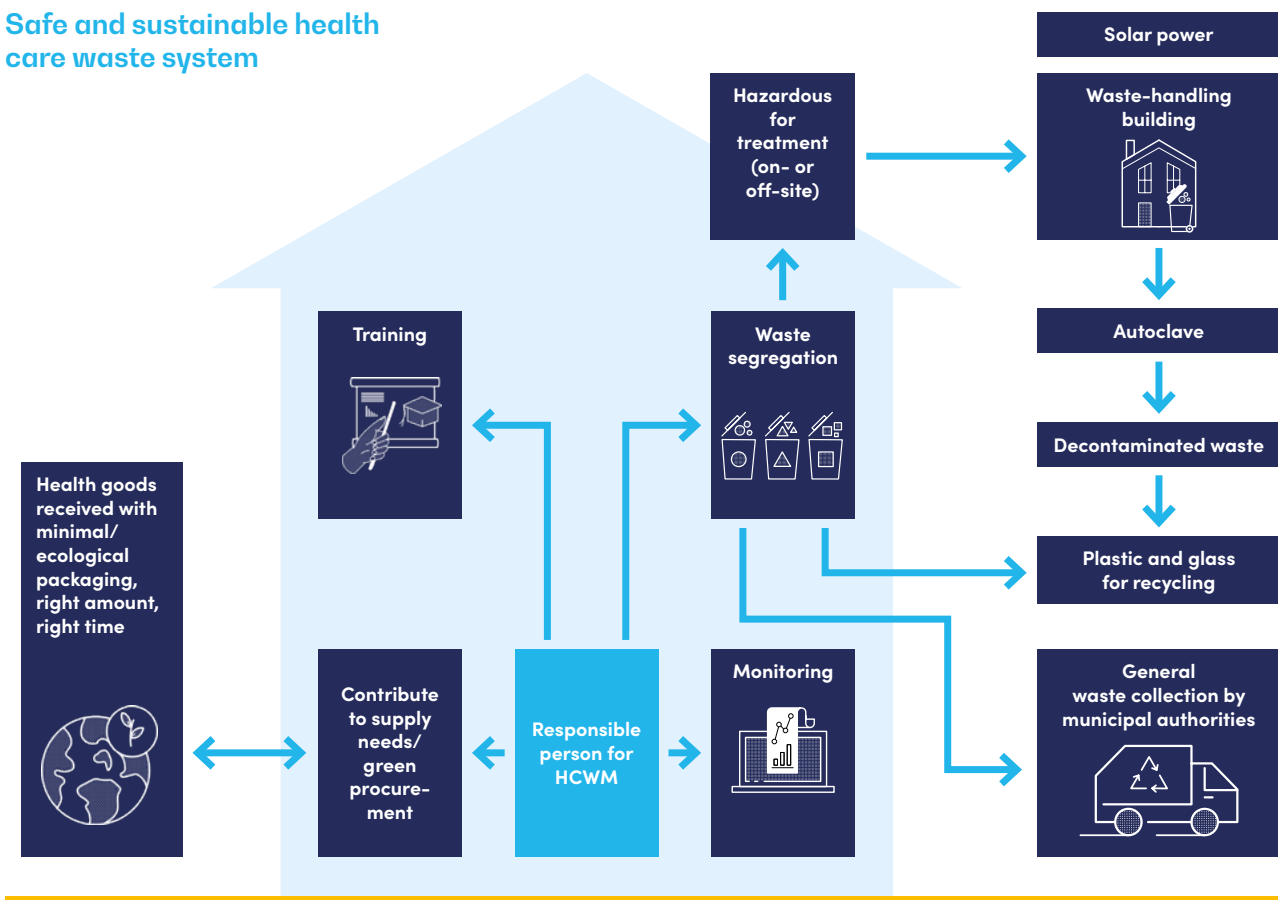
Improvements

Suggested health care waste improvements are listed in the table below.

Domain	Improvement
Training	<ul style="list-style-type: none"> Establish or reinforce a continuous health care waste management training, mentoring and monitoring system for clinical, cleaning and waste management staff. Set targets and track progress towards achieving them.
Segregation	<ul style="list-style-type: none"> Segregate waste into (at a minimum) non-hazardous, infectious and sharps waste (three-bin system) to protect staff, patients and the public from infections. Where pharmaceutical or chemical waste is generated, it should be segregated, documented, and stored for collection and disposal at the regional or national level (centralized treatment). Ideally, general waste is segregated further into recyclables (e.g. plastic, glass, organic, paper) and non-recyclables.
Transport, storage and disposal	<ul style="list-style-type: none"> Transport and store hazardous and non-hazardous waste separately. Document the volume of infectious waste being generated at regular intervals (e.g. weekly or monthly). Store infectious and sharps waste in an enclosed area that is locked, ventilated and not accessible by unauthorized persons. Store other hazardous waste (chemical or pharmaceutical) separately. Establish a waste inventory system and ensure regular collection by regional or national authorities. Bury ash from incineration in a dedicated ash pit. Ash from incineration is potentially hazardous because it can contain dioxins and furans, heavy metals, and sharps such as broken glass and needles. Ensure that non-hazardous waste is collected regularly by the municipality or an external company, or buried safely to minimize the risk to the public. Where possible, verify that the waste is disposed of safely in a well managed landfill by a licensed entity.
Sustainable technologies and practices	<ul style="list-style-type: none"> Choose safe and environmentally sustainable non-burn technologies such as autoclaving, where possible. If non-burn technologies are not feasible (e.g. water or electricity is not reliably available), for small facilities, consider treatment at a centralized facility or nearby health care facility with appropriate health care waste management technologies. In larger facilities, high-temperature incineration with air pollution control can be considered. Where resources are limited or as a temporary measure, locally well constructed incinerators may be an interim solution. Use of heat-resistant refractory bricks and mortar, and constructing and using two chambers will improve the performance of locally constructed incinerators. Ensure proper operation and maintenance of treatment facilities, including pre-heating before burning waste, regularly cleaning out ash and not overfilling facilities. Plan for incremental improvement. Waste should be treated safely by authorized persons, and incinerators should be well maintained. PPE use should be targeted and appropriate for the level of risk associated with the task (e.g. risk of exposure to chemicals or body fluids). When possible, safe, reusable PPE should be used (e.g. rubber boots and aprons) to reduce waste associated with disposable, single-use PPE. Reusable PPE also saves money over time. Initiate recycling activities when a formal or informal recycling sector for plastic or paper is available. Reduce the quantity of waste by segregating recyclables at the point of generation (e.g. plastic bottles, cardboard from packaging material) and establish composting or biodigestion of garden waste. Approximately 85% of waste is considered non-hazardous, and much of this can be recycled or composted.

Domain	Improvement
Procurement and budgeting	<ul style="list-style-type: none"> Use environmentally sustainable procurement practices to prevent or minimize the generation of waste, such as the following. <ul style="list-style-type: none"> Prioritize reusable medical products such as surgical instruments (clamps and forceps) or accessories to endoscopes (graspers and scissors), instead of disposables, to prevent generation of waste. Minimize the procurement of polyvinyl chloride (PVC)-containing materials (e.g. gloves, tubing) to prevent generation of dioxins and furans where waste is incinerated. Ban mercury-containing equipment from the procurement list and phase out existing mercury-containing devices according to the Minamata Convention. Choose LED bulbs instead of mercury-containing light bulbs and fluorescent bulbs. Calculate an annual budget for health care waste management, including essential disposables such as coloured bags and sharps containers, and operation and maintenance costs for waste treatment equipment and infrastructure (including water and energy required for operating infrastructure).
General	<ul style="list-style-type: none"> Plan for incremental improvement of health care waste management infrastructure and practices towards a safe, sustainable and climate-resilient system.

Safe and sustainable health care waste system



Related tools and further reading

WHO (2014). *Safe management of wastes from health-care activities*, second edition. <https://apps.who.int/iris/handle/10665/85349>

WHO (2017). *Safe management of wastes from health-care activities: a summary*. <https://apps.who.int/iris/handle/10665/259491>

WHO (2019). *Overview of technologies for the treatment of infectious and sharp waste from health care facilities*. <https://apps.who.int/iris/handle/10665/328146>

WHO (2020). *WHO guidance for climate resilient and environmentally sustainable health care facilities*. <https://apps.who.int/iris/handle/10665/335909>