**Health Care Waste Management Audit Procedures ‒ Guidance**

**Document Number: 203**

*Note: This guidance document is provided as a template and must be customized to accommodate facility specific procedures and terminology.*

1. **Purpose**

This document is intended to provide information on how to appropriately audit laboratory waste management systems.

1. **Scope**

The general intent of a waste audit is to determine if waste is being correctly separated into its particular type and if it is being correctly and safely handled, treated and disposed of with respect to its type and hazard level. Audits are the single most important means for a facility to know the status of its waste management system, to identify current gaps in waste management practices and to determine how to improve practices.

There are a number of approaches that can be used to audit waste management practices, such as waste stream audits, routine inspections or spot checks of discreet areas or stages of the waste management process, and formal audits of waste management policies and practices. The type of approach to be used depends on the objectives, and a facility will likely use a combination of approaches. Regardless of the approaches used, it is important that all steps of the waste management system are assessed routinely (waste generation, transportation, storage, treatment and final disposal) because this reveals the most about the actual functioning of the waste management system.

1. **Definitions**

**Audit** – a formal waste audit can be performed by an external auditor or by facility staff if staff have the expertise to do so. Waste audits can reveal the knowledge, attitude and practices of the staff as well as information on actual occupational safety practices. A formal waste audit may include a waste stream audit.

**ETP** – effluent treatment plant

**PPE** – personal protective equipment

**Routine inspection or spot checks** – can be done frequently (e.g., daily or weekly) or less frequently by the facility waste manager or other responsible person. These inspections use simple checklists to immediately identify gaps in practices.

**STP** – sewage Treatment Plant

**Waste stream audit** – a formal, structured process to quantify the amount and types of waste being generated by a health facility or a laboratory. Waste stream audits should include all type of wastes within a facility, e.g., paper and office waste, biomedical or infectious waste, kitchen or other municipal waste, construction and demolition waste, etc.

1. **Responsibilities**
   1. All facility staff should know the type of waste they generate as well as how to segregate and store it in appropriate color-coded bins. Some staff, such as laboratory technicians, waste handlers and cleaning staff, have additional responsibility to manage the waste. They should be able to segregate infectious and hazardous waste from nonhazardous and general waste, to know proper use of PPE, and how to handle the hazardous waste as well as how to finally dispose of the waste.
   2. The facility safety officer or waste management coordinator should regularly inspect the entire facility to ensure every step of waste management is being done properly.
   3. It is the responsibility of the facility director to ensure that appropriate and adequate waste management practices are in place and that all staff are trained in them and adhere to the procedures and policies. Ultimately, it is the responsibility of the facility director to ensure that audits are conducted regularly by an individual expert or organization.
   4. It is the responsibility of the waste management oversight committee and coordinator to establish systems to monitor compliance with the agreed-upon medical waste procedures and to conduct regular and routine audits of the waste management system. After audits, routine monitoring activities, and other system audits, the waste management oversight committee and coordinator are responsible for identifying improvements in waste handling systems and providing recommendations to the senior management of the institution.
   5. An individual consultant or organization who is appointed by the facility director should conduct the waste audits methodically and identify the gaps in waste management practices and recommend further improvements.
2. **Materials and Equipment**

* The auditor may need to refer to:
* Facility health care waste management policy
* Facility safety procedures
* National or regional medical waste treatment guidelines
* Previous audit/inspection reports
* Accident or incident reports
* Collection records where final disposal is off-site
* Service agreement, if collection and/or treatment is outsourced
* Service agreement, if housekeeping is outsourced
* Service agreement, if waste handling is outsourced
* Staff training logs
* Standard operating procedures for housekeeping and waste handling
* Standard operating procedures for the laboratory
* Standard operating procedures for waste holding and storage
* PPE – gloves, overalls/lab coat, sealed shoes/boots, eye protection, face mask (surgical or similar to prevent inhalation of particles and aerosols)
* Tongs and other waste handling tools
* Bins, buckets, bags, safety boxes and other waste containers
* Camera

When conducting audit visits, refer to appropriate SOPs for necessary materials and equipment.

1. **Hazards and Safety Concerns**

When conducting audit visits, refer to appropriate SOPs for relevant hazards and safety concerns.

1. **Procedures**
   1. Preparing for the audit
      1. Facilities are encouraged to contact the authorized agency, individual consultant or waste auditor for more information on waste auditing. Audits can be done either in-house (using agency staff), be contracted out, or a combination of both. Before an audit is begun, a number of issues need to be considered:
      2. Establish objectives of the audit.

The audit's objectives will largely determine the documents, records, and physical locations to be audited. Audit objectives can include, but are not limited to, the following:

* Assess the overall effectiveness of the facility’s waste management system.
* Identify and mitigate uncontrolled exposures from infectious waste to workers, patients, and the public.
* Evaluate the cost effectiveness of existing waste management practices.
* Understand the occupational health status related to the facility waste management.
* Assess the knowledge, attitudes and practices of the staff regarding waste management.
* Measure the effectiveness of existing waste management systems.
* Identify opportunities for improving waste management systems and strategies.
* Collect baseline data for measuring the effectiveness of waste minimization strategies.
* Detect and prevent errors and misconduct in medical waste management.
* Determine the composition and quantities of waste being generated.
* Identify gaps in waste segregation, handling, treatment and final disposal.
* Determine if some generated waste could be recycled rather than disposed of.
* Identify the waste treatment technologies used in the laboratory and determine if the available technology is safe and appropriate
  + 1. Secure management approval and support

Management support is essential for ensuring the smooth completion of the audit, and means that any findings or recommendations are more likely to be considered and implemented. Also, management support is needed to justify the time and resources for the audit.

* + 1. Estimate time and resources needed

The amount of time and resources will depend upon the scope of the audit and the size of the facility. Others might need to be trained to audit their respective departments. Alternatively, temporary staff or professional auditing contractors can be used.

* + 1. Consider safety issues

Training, safety equipment, hepatitis B vaccination and tetanus shots must be organized to ensure that sorters are safe from potential hazards associated with handling waste. Involving the agency’s occupational health and safety officer(s) can be helpful.

* + 1. Protect confidentiality

The confidentiality and privacy of documents or personal information found in the waste stream must be assured. Ideally, confidential documents should be shredded. No documents can be read or removed from the sorting area. If waste is to be transported to another location to be sorted, then it must be stored and disposed of securely. If external contractors are used for the sorting, then it is advised that they sign a confidentiality agreement.

* + 1. Keep the date of the audit a secret

Staff must not know when the audit is happening, otherwise they may change their waste behaviors and audit results will not represent normal waste practices.

* 1. Conducting the waste audit

During the planning stage of the waste audit, it is necessary to visit the facility to collect background information on the staff’s level of knowledge and awareness of various aspects of waste management. To collect information on these issues, a structured questionnaire can be used. (Refer to the Health Facility Assessment Tool).

* + 1. Adequacy of existing policies and procedures. This should include reviewing the availability of country policies and guidance, facility policies, and workplace procedures.
    2. Review of periodic oversight. Periodic review of waste collection, handling, and treatment should be conducted by supervisors of patient care areas, waste handlers, and waste treatment equipment operators. Periodic oversight should include documented inspections.
    3. Effectiveness of waste treatment and disposal methods. Waste treatment equipment procedures and log sheets should be reviewed to ensure equipment, chemical disinfection, or other methods are being used properly.
    4. Level of awareness and knowledge. A qualitative audit can help establish the level of knowledge and awareness of all staff on issues such as waste management, occupational safety, injection safety, health hazards of mercury and infection prevention, and existing hygiene and sanitation. This information will ultimately help in designing advocacy and training needed for the facility.
    5. Waste handling practices

The auditors should observe and collect information on:

* Bin location. The locations of bins play an important role in successful segregation. Location helps to identify the reasons behind waste mix-ups. Bins for infectious and hazardous waste should not be located in areas accessible to patients and the public.
* Size of containers. Similarly, the size of the container needs to be noted. The size of the container also needs to match the volume generated at each particular location.
* Color coding and the labeling of the bins. Standard color coding and labeling plays important role in maintaining a proper segregation system throughout the health care facility.
* Waste handling practices. The waste handlers should be observed during the waste audit period.
* Use of PPE.
* Transportation. While observing transportation, document the route, the transport trolley and the handling practices in the course of the transportation of both general and the infectious waste.
* Waste storage practices and final disposal techniques. The storage practices, especially for infectious waste, should be observed both before and after the treatment of the waste.
  + 1. Occupational safety practices

It is necessary to observe and record the practice of using sharps-destroying equipment. Similarly, it is important to observe the use of PPE in the waste handling process including use of appropriate footwear.

Conducting a quick survey on sharps injury (and subsequent management of occupational injury of staff if any) and staff vaccination status is equally important to assess the occupational safety of the facility.

* + 1. Existing hygiene and sanitation status

It is necessary to observe the cleanliness status of wards, laboratory and wash rooms and to observe the cleaning practices of the facility housekeeping/support staff. Similarly, status and cleanliness of buckets and bins should be recorded. Auditors should assess where the treatment process happens – for example, treating infected waste in the same or a separate room from where materials are sterilized for re-use in the laboratory.

* 1. Conducting regular waste management inspections

In addition to formal audits, more frequent inspections of waste handling and housekeeping procedures should be conducted by the waste management officer or other responsible person. See:

* Doc 204: Inspection Checklist: Housekeeping/Waste Handler
* Doc 205: Inspection Checklist: Waste Holding and Storage
* Doc 206: Inspection Checklist: Laboratory Waste Management
* Doc 207: Inspection Checklist: Supervisor/Matron
  1. Conducting the waste stream audit

The five basic steps to doing an audit are summarized.

* + 1. Plan the waste stream audit carefully and define the area to be audited (a particular ward, laboratory, the entire facility, etc.).

Good planning is essential to ensuring the audit goes smoothly. You will need to get management support, define the objectives, may need to hire, train and organize people to conduct the audit. The planning process may take time but the better planned it is, the more likely you are to gather useful, accurate information. Some estimates of how long it takes to do a waste audit are provided in Table 1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 1: Time and resource estimate for different organizations** | | | | |
| **Type of facility** | **Number of staff** | **Number of days waste is collected** | **Number of trained sorters needed** | **Time to do segregation** |
| Small and single story | ≤20 | 5 (or 7 if the lab operates all week) | 2 | 1‒5 hours |
| Medium sized with three stories | >20, <100 | 5 or 7 | 6‒8 | 1‒2 days |
| Large, multi-story building | 450 – 500 | 5 or 7 | 10‒15 | 3‒5 days |

* + 1. Collect the waste from the audited area.

Cleaners or waste contractors can collect the waste for you. You will need to talk to building managers and cleaning supervisors to get their support. Cleaners must have clear instructions about the types of waste they are to collect and how to label the bins or bags to identify the source of the waste. For example, cleaners should label where the waste came from (e.g., “Level 1 pathology lab,” “Level 2 kitchen,” “Level 3 offices,” etc.). A trial run before the start of the official collection period is recommended; this will help the cleaners identify and solve any problems in the collection process.

* + 1. Segregate the waste into different categories and record the data.

Accurate segregation of the waste is critical. Note that there are separate procedures for solid and liquid waste. After recording the location from which the bin or bag of solid waste comes, the bin/bag should be weighed and emptied onto the table and segregated into waste categories (e.g., infectious, sharps, office paper and plastics, metal, biodegradable waste etc.). Staff should use tongs or similar tools to segregate the waste and should not touch it with their hands. Each category is then individually weighed and recorded. Similarly, chemical and liquid wastes need to be classified and quantified. The table is then cleaned, the sorted waste disposed of, and the process is repeated for the next bag. This continues daily for one week, if time permits. Summary data should be recorded on the standard form (see Attachment 11.1). It is important that appropriate safety measures, like wearing of proper PPE, are taken by those segregating and handling the waste.

* + 1. Treatment and final disposal of the waste.

The waste treatment facility and techniques used to treat hazardous waste need to be audited as well. The facility may have an on-site or an off-site waste treatment facility, but you need to ensure that the infectious and hazardous chemical wastes are treated properly before final disposal. Laboratory cultures and stocks of infectious agents must be treated within the facility before being taken away from the facility. Note whether the technologies used to treat the waste are safe, cost effective and environmentally friendly. If the laboratory has an off-site treatment center, then you will need to visit that center to collect data on whether they properly treat the waste with appropriate technologies. Note if the center uses an approved nonincineration treatment technology such as an autoclave-shredder, integrated steam treatment system, or microwave unit.

Note also whether the laboratory treats its liquid waste (waste water and chemical) before being releasing it to the environment. If the laboratory is connected to a sanitary sewer that is linked to a wastewater treatment plant, then the treated wastewater from the facility should meet national or international standards. All final disposal methods should be audited as well.

* + 1. Analyze the data and write up the results.

Once the waste is segregated and measured, you will have data sheets showing the quantity of waste generated within each area audited by waste categories. These data can then be entered into a database and analyzed, and the results can inform improvement efforts.

See Table 2 for a concise summary of these steps.

|  |  |  |
| --- | --- | --- |
| Table 2. Waste auditing: the five steps | | |
| A. PLAN | **1. Define the study area.** | * Agree on schedule of audit with the management. * Set audit objectives and method. * Determine locations to be audited (entire facility or part of it). * Determine types and approximate quantities of waste to be audited. |
| **2. Collect background information.** | Visit locations and record:   * Number of employees in each location * Number, types and locations of bins (infectious and hazardous waste bins should not be located in public areas) * Types of waste seen * Who empties bins and when |
| **3. Prepare for the audit.** | * Collect auditing equipment (PPE, scale) and tools. * Finalize questionnaire for the staff, if any. * Brief/train cleaners and sorters. * Finalize waste collection details. * Double-check locations of bins. |
| B. COLLECT | **1. Collect the waste.** | * Waste handlers must wear PPE. * Collect all waste daily. * Label bin/bags showing location and day. * Record relevant collection details. |
| **2. Transport the waste to the area for segregation.** | * Store waste on site if possible, otherwise transport to secure location using a licensed transporter. * Liquid waste should be transported separately and very carefully. It may not need to be segregated but will need to be classified and quantified. |
| C. SEGREGATE | **1. Prepare the segregation area.** | * Ensure PPEs are used before handling waste. * Cover tables with plastic for solid waste. * Set up tables and scales. * Collect buckets, bins, brooms, etc. * Have water and first aid kit on hand. |
| **2. Segregate the solid waste.** | * Weigh each bag. * Carefully open bag and spread waste  on table. * Segregate into different material categories using tongs or other tools. * Count and/or weigh individual materials. * Record findings on data sheet. * Dispose of sorted waste. * Repeat for all bags of the day and continue the process for a week. |
| **3. Carry out clean-up and decontamination**  **at the end of each day.** | * Dispose of sorted waste. * Clean and disinfect tables. * Clean buckets and disinfect and other equipment. * Sweep and disinfect floor. * Shower and change clothes. |
| **D. TREATMENT**  **and**  **DISPOSAL** |  | * Auditor should visit treatment facilities and final disposal area (either on-site or off-site) to collect information. * Check if the incinerator, if used, meets the standards. * Record how they treat the chemical and liquid waste. * If the lab has a sewage treatment plant (STP) or effluent treatment plant (ETP), check to see if it meets all the requirements. |
| E. ANALYSE | **1. Enter and analyze the data.** | * Enter data sheets into spreadsheet. * Do calculations. |
| **2. Prepare an audit report.** | * Prepare audit report, including findings and recommendations. |

1. **Reporting and Recordkeeping**
   1. The auditors should take accurate and thorough notes. Auditors should produce a report that includes a summary and discussion of the data they collected and highlights any areas that need improvement.
   2. All final audit report and notes should be submitted to the HCWM committee and HCWM coordinator. Completed inspection checklists should be shared with the HCWM oversight committee and the HCWM coordinator. They should be made accessible as needed for monitoring, evaluation and future audits.
   3. Inspection results should be filed for a minimum of three years or longer if local regulations require, so that any persistent problems can be identified and the effects of any changes can be tracked, and for reference by the regulatory authorities.
   4. Whenever possible, the health care facility should make inspection results public if need be.
2. **References**
   1. Prüss A, Giroult E, Rushbrook P, editors. Safe management of wastes from healthcare activities. Geneva: World Health Organization; 1999.

<http://www.who.int/water_sanitation_health/medicalwaste/wastemanag/en/>

1. **Related documents**

* Doc 204: Inspection Checklist: Housekeeping /Waste Handler
* Doc 205: Inspection Checklist: Waste Holding and Storage
* Doc 206: Inspection Checklist: Laboratory Waste Management
* Doc 208: Audit Checklist: Autoclave Operation
* Doc 209: Audit Checklist: Incinerator Operation
* Health Facility Assessment Tool

1. **Attachments**
   1. Daily Waste Generation Log

**Attachment 11.1: Daily Waste Generation Log**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Waste category** | **Total weight of each waste category (in kg)** | | | | | | | **Weekly total (kg)** | **Daily average (kg/day)** | **Remarks** |
| Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 |
| **Infectious** |  |  |  |  |  |  |  |  |  |  |
| Gloves |  |  |  |  |  |  |  |  |  |  |
| Bandages/dressings |  |  |  |  |  |  |  |  |  |  |
| Sharps |  |  |  |  |  |  |  |  |  |  |
| Syringes |  |  |  |  |  |  |  |  |  |  |
| Other infectious |  |  |  |  |  |  |  |  |  |  |
| **Pathological/anatomical** |  |  |  |  |  |  |  |  |  |  |
| **Pharmaceutical** |  |  |  |  |  |  |  |  |  |  |
| **Noninfectious** |  |  |  |  |  |  |  |  |  |  |
| Paper |  |  |  |  |  |  |  |  |  |  |
| Plastic |  |  |  |  |  |  |  |  |  |  |
| Glass |  |  |  |  |  |  |  |  |  |  |
| Metal |  |  |  |  |  |  |  |  |  |  |
| Rubber |  |  |  |  |  |  |  |  |  |  |
| Food |  |  |  |  |  |  |  |  |  |  |
| **Daily total (kg)** |  |  |  |  |  |  |  |  |  |  |
| **No. of clients per day** |  |  |  |  |  |  |  |  |  |  |
| **Kg per person per day** |  |  |  |  |  |  |  |  |  |  |