**Sanitary Sewer Disposal of Liquid Laboratory Waste — Guidance**

**Document Number: 521**

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

# Purpose

This document provides guidance and procedures to laboratory directors and laboratory staff on the proper disposal of liquid waste from laboratory activities to a sanitary sewer.

# Scope

This document covers how sewer disposal of health care wastes should be monitored for adherence to guidelines on types of chemicals, quantities and rates, and flushing procedures.

# Definitions

**Biohazardous waste**, also known as **infectious waste**, is any waste containing infectious or potentially infectious substances and includes blood, blood products and body fluid wastes.

**Blood and blood products** include discarded bulk human blood and blood products in free draining, liquid state, body fluids contaminated with visible blood and materials saturated or dripping with blood. Blood Products do not include used feminine hygiene products used in non-patient areas.

**Pathogens** are micro-organisms that may cause disease.

**Infectious waste** is any waste that may contain pathogenic organisms and may overlap with the other medical waste categories of sharps, pathological and anatomical waste, all of which can be infectious, including:

* Blood from open wounds, wound draining, cleaning and spill response, transfusions and other activities, excluding pathological waste, such as body parts, tissues and placenta
* Body fluids, including secretions, but excluding excreta, unless from patients in isolation
* Waste materials contaminated with free-flowing blood
* Laboratory samples containing blood or body fluids

**Disinfection** is the reduction or removal of pathogens to minimize the potential for disease transmission.

**Precautionary principle** or approach requires that if there is a suspected risk of causing harm to the public or the environment, in the absence of scientific consensus that it is harmful, the presumption is that it is harmful. It aims to prevent harm, rather than to manage it afterward.

# Responsibilities

* 1. Facility manager – Has the overall responsibility and accountability for waste generated and managed on site, as well as for transport from the facility for treatment and/or disposal off-site. The manager is also responsible for ensuring that sufficient resources are allocated to waste management to ensure compliance with legal and other requirements.
	2. Facility management and supervisors – Are responsible for checking that appropriate standards are set and maintained on a daily basis in their areas and ensuring that problems are resolved.
	3. Waste generators – Must ensure that they exclusively handle the waste and also ensure it is properly segregated at the source and suitably contained to reduce the risk of exposure to others.
	4. Waste handlers – Must ensure that waste in the intermediate storage areas is properly segregated, contained and labeled correctly. If problems are noticed, they should be immediately brought to the attention of the responsible person in that area.
	5. Waste management officers – Are responsible for ensuring that waste is managed according to legal and other requirements, checking that standards are maintained, that everyone is aware of these requirements, that relevant personnel are appropriately trained to safely deal with waste in their areas and that all necessary data is recorded and transmitted to the waste management committee and regulatory authorities.
	6. Waste Management Committee – Is composed of representatives from the senior management, those who generate waste, waste handlers, infection control, procurement and stores, catering, long-term or resident contractors and waste management service providers. This committee should meet monthly to discuss the key performance indicators (e.g., volume of waste generated, hazardous vs. general waste ratio, incidents, audit findings, etc.) and to plan awareness programs and other initiatives to improve compliance with legal and other requirements. For smaller facilities, this committee can be the Infection Control/Safety or Health (and Environmental) Committee.
	7. Contractors – Must ensure that their staff are properly aware of and trained to comply with waste management requirements, routinely checking to ensure standards are maintained.

# Materials and Equipment

Appropriate PPE. When handling liquid lab wastes, always use:

* Eye protection (safety glasses or goggles) to protect against splatter
* A mask to prevent breathing air-borne pathogens
* Gloves to protect your skin from spills or leaks
* Laboratory coat or other protective clothing to protect your upper body from spillages
* Closed shoes

# Hazards and Safety Concerns

* 1. Always:
	+ Wear appropriate PPE (see Section 5).
	+ Use the ***precautionary principle*** – if the hazard is unknown, assume the worst - only if the blood or blood products are **shown** to be uncontaminated, may you assume that they are not hazardous.
	+ Protect cuts or skin abrasions by using a plaster to close the wound.
	+ Wash your hands with soap after handling blood or blood products.
	1. Infectious Waste

The hazard arises from liquid lab waste that may be contaminated by pathogens. Remember that if the drain or sewer becomes blocked, the maintenance personnel or plumber will have to manually clear the debris, which puts them at risk from exposure to pathogens too. They will also need to take steps to prevent exposure to infectious organisms and wear the appropriate PPE.

* 1. Sharps

If there is a needle present, make sure that it is discarded as sharps waste and not left attached to the pack. In removing the needle from the blood pack, make sure that you cannot be spattered by blood or allow the blood to leak out and spill.

# Procedures

# Bulk liquid waste, blood, and blood products

All liquid biohazardous waste from humans or animals such as blood, blood products, and certain body fluids can be disposed of directly by flushing down a sanitary sewer unless the facility sewer discharges into a public waterway.

The drain-disposal procedures and rules in the laboratory waste management plan should be based on a thorough knowledge of local regulations pertaining to materials that are acceptable for disposal in the local sanitary sewer system.

Laboratory drain systems are connected to sanitary sewer systems. Some chemicals can interfere with the proper functioning of sewage treatment facilities. In the laboratory drain system itself, some chemicals can create hazards of fire, explosion, or local air pollution; others can corrode the drain system.

# General sanitary sewer disposal criteria

Only substances that meet all of the following criteria are allowed down the sanitary sewer drain:

* Non-hazardous: no radioactive waste, no hazardous chemical waste
* Liquid: no solids, sludges, or viscous substances
* Will not interfere with sewage treatment operations: no corrosive pH levels, no grease or oil

# Blood and blood products

The following factors should be considered when deciding if this is suitable for any given facility:

• Quantity: it is usually acceptable to dispose of small quantities of blood products to the sewer.

• Capacity: where the sewer system is connected to an authorized wastewater treatment works or suitable septic tank system, blood, blood products and body fluids do not need to be disinfected before being poured down the drain or into a toilet. This may require a formal assessment and application for authorization.

* Waste that has been treated with disinfectants or other toxic chemicals should only be discharged into the sewer if it has been determined by the relevant authorities that the chemicals will not harm the wastewater treatment system.

• Blockages: under certain circumstances, blood can congeal to block pipes, requiring expensive maintenance and potentially exposing maintenance personnel to hazards from the blood. However, blood for transfusion generally contains anticoagulants to prevent clotting during storage, so this should not be a hazard in this case. This problem can be minimized by a) identifying products which could congeal and ensuring that they are flushed away with sufficient water to prevent coagulation and b) disposing of blood products via wide bore pipe systems.

• Splashing/aerosolisation: measures should be taken to prevent splashing and the formation of respirable droplets, and personnel should wear PPE such as gloves, goggles, mask and face shield to protect them from any that do occur. Measures to reduce splashing can include partly filling a sink with water and emptying the container under water, or adapting a toilet to eliminate any air gaps around the lid, so that any droplets created during flushing cannot enter the air of the room.

• Once the discard is complete, the sink area must be washed and disinfected to prevent the spread of disease from any pathogens the blood may contain. A sink or toilet in a dedicated area should be used. It should not be accessible by patients and the public.

* Personnel performing maintenance on sinks etc. that are used for the disposal of blood and blood products should be suitably trained about the hazards and provided with PPE.

# Blood-saturated materials

* These wastes must never be discarded to the sewer system as they may cause blockages and pose a risk to staff who then have to clear the pipes.
* They shall be rendered uninfectious by treatment. As with blood products, this may be carried out onsite or offsite; autoclaving is the preferred on-site treatment method.

# Reporting and Recordkeeping

# Records should be maintained with information on the types and quantities of chemicals that the laboratory site puts into the sanitary sewer system and on the toxicity and biodegradability of these chemicals.

# Each biohazardous waste generating entity is required to maintain written records which, at a minimum, contain the following information: Date of treatment, Quantity of waste treated, Method/conditions of treatment and Name (printed) and initials of the person(s) performing the treatment.

# Information on appropriate protective clothing, footgear, face protection, respiratory protection, and absorbent material for liquids should be recorded and readily available. These are personal safety requirements whose deviations should be reported immediately.

# Personnel should be trained to deal with the most probable incidents, and the training records must be kept. Among the techniques likely to be needed are the plugging of pinhole leaks in large containers, cleanup of spills, and transfer of liquids from one container to another.

# An emergency response plan that anticipates possible emergency situations should be recorded and reported. Example emergencies include a leaking drum in storage or in transport, a flash fire, or a splash of chemical on a person.

# The recordkeeping requirements for transportation, treatment, and disposal are extensive and depend on the ultimate fate of the waste. Requirements frequently involve a complete characterization of the waste, i.e., a chemical analysis of mixed wastes or a complete contents list for lab packs. While it may be tempting to generate the required information when the waste is moved out of storage, it is better practice to keep a running inventory of wastes and contents of waste containers in storage. This helps with the necessary paperwork, usually assures more accurate information, and is safer. It is not good practice to store containers whose contents are not known. A good way to collect the information is to establish a log-in/log-out procedure for the storage area.

# Incidents involving chemicals during and after shipment can pose problems and should be reported and especially if persons knowledgeable in safe responses to the incident are not readily available. It is essential that vehicle drivers and disposal facility operators be informed on the hazards of the waste and that appropriate emergency response instructions be available.

# References

# United Nations Environment Programme (UNEP). Compendium of technologies for treatment/destruction of healthcare waste. Osaka: UNEP; 2012. 226 p.

# <http://www.unep.org/ietc/Portals/136/News/Publication%20of%20Healthcare%20Waste%20compendium%20of%20technologies/Compendium_Technologies_for_Treatment_Destruction_of_Healthcare_Waste_2012.pdf>

# Centers for Disease Control and Prevention. Guidelines for safe work practices in human and animal medical diagnostic laboratories: recommendations of a CDC-convened, Biosafety Blue Ribbon Panel. Morbidity and Mortality Weekly Report. 2011;60(Suppl):1-102.

# <http://www.cdc.gov/mmwr/pdf/other/su6101.pdf>

# Biomedical Waste Management Guide. Yale University –Office of Environmental Health & Safety. April 2011.

# <http://ehs.yale.edu/sites/default/files/Waste%20Management%20Guide.pdf>

# Waste Disposal Guide. Environmental Health & Safety (EHS)/Office of Radiation, Chemical & Biological Safety(ORCBS). Michigan State University. 2009.\

# <http://www.ehs.msu.edu/waste/programs_guidelines/WasteGuide/wg_02toc.htm>

# Environmental Regulations and Best Management Practices. Laboratory Operations in the Capital Regional District.2007.

# <http://www.crd.bc.ca/wastewater/sourcecontrol/documents/LabOps2.pdf>

# Waddell, Dave. Laboratory Waste Management Guide, Final Report. Seattle, WA: Local Hazardous Waste Management Program in King County, 2005.

# <http://www.labwasteguide.org>

# Laboratory Safety, Waste Disposal and Chemical Analyses Methods. Stormwater Effects Handbook.

# <http://unix.eng.ua.edu/~rpitt/Publications/BooksandReports/Stormwater%20Effects%20Handbook%20by%20%20Burton%20and%20Pitt%20book/appe.pdf>

# Management and Disposal of Biological Waste. Texas A&M International University, TAMIU Rev 4/99

# <http://ehsd.tamu.edu/documents/AgriculturalSafety/biowaste03.pdf>

# Sewer Disposal Guidelines. University of California, Irvine Environmental Health and Safety (www.ehs.uci.edu).Version 2.0

# <http://www.ehs.uci.edu/programs/enviro/SewerDisposalGuidelines.pdf>

# Chemical Waste Disposal Procedures. University of Toronto

# <http://www.ehs.utoronto.ca/services/environmental/chmdisp.htm>

# Related Documents

# Doc 308: Incident Reporting Form

# Doc 522: On-site Treatment and Disposal of Blood Transfusion Products – Guidance

# Attachments

None