

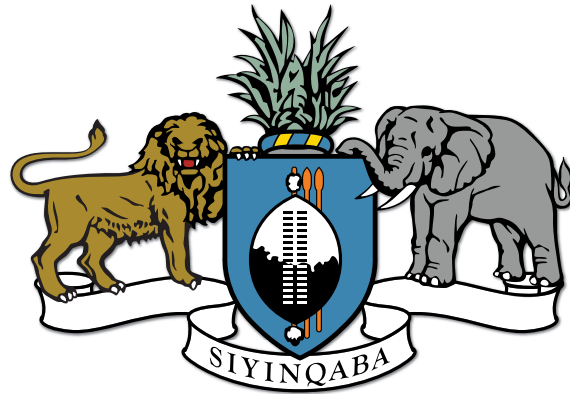
Laboratory Waste Management Guidelines

Proper management of
health care risk waste
derived from a
laboratory environment



SWAZILAND





Kingdom and Government of Swaziland
Ministry of Health

Laboratory Waste Management Guidelines

Proper management of health care risk waste
derived from a laboratory environment

7 November 2013



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Table of Contents


Recommended Citation.....	ii
Acknowledgments.....	iii
Table of Contents.....	iv
Definitions.....	vii
Acronyms.....	iii
Introduction	
Intention?.....	3
What is Laboratory Waste?.....	3
1. Waste Segregation	4
2. Packaging / Containerization	6
3. Storage Requirements	8
4. Collection Frequency	8
5. Spill Management	9
5.1 The Various Forms of Hazardous Waste.....	9
5.2 A Spill – First Steps.....	9
5.3 Spill Management.....	9
5.4 General Blood Spill Cleanup Guide.....	10
5.5 Vaccine Spill Cleanup.....	13
5.6 Chemical Spill Procedure.....	13

5.7 Spill Prevention Behaviour.....	13
5.8 Reduce Risk.....	13
5.8.1 Work Practice Controls.....	13
5.8.2 Work Practice Controls.....	13
5.9 Bloodborne Pathogen Spill Kit.....	13
6. Chemical Management	15
6.1 Excess Chemical Product.....	15
6.2 Important Notes on Chemicals.....	15
6.3 Packaging Chemical Wastes.....	15
6.3.1 General.....	15
6.3.2 Storage.....	15
6.3.3 Chemical Spill Management.....	15
Annexure.....	17
Annex A: Hazard Classes and Symbols.....	17
A.1 Hazard Classes	
International Hazard Labels.....	17
Annex B: Chemical Storage.....	21
B.1 Chemicals that can and can't be mixed for waste storage.....	21
B.2 Incompatible Chemicals.....	21
B.3 Reactions that can occur.....	23
B.4 References for Annex B Tables.....	24
Annex C: Example of Inventory List for Chemical / Pharmaceutical Waste.....	25
Annex D: Health Care Waste Streams - Poster.....	26
Annex E: Quick Guide to Disposing Laboratory Waste - Poster.....	28
Annex F: Spill Management & Emergency Response Plan - Poster.....	30
References.....	31

Acronyms

CDC	Center for Disease Control
BBP	Blood-Borne Pathogen
EHD	Environmental Health Department
HCF	Health Care Facility
HCRW	Health Care Risk Waste
HCW	Health Care Waste
HCWM	Health Care Waste Management
IPC	Infection Prevention Control / Committee
ISO	International Organization for Standardization
MoH	Ministry of Health
NCLS	National Clinical Laboratory Services
PFSCM	Partnership for Supply Chain Management
PPE	Personal Protective Equipment
PEPFAR	President's Emergency Plan for AIDS Relief
QA	Quality Assurance
SABS	South African Bureau of Standards
SANS	South African National Standard
SCMS	Supply Chain Management Systems
SEA	Swaziland Environmental Authority
SHLS	Swaziland Health Laboratory Services
SOP	Standard Operating Procedure
SWSC	Swaziland Water Services Corporation
USAID	United States Agency for International Development
USG	United States of America Government
WHO	World Health Organization

Definitions

Anatomical Waste / Pathological Waste	Anatomical Waste (also often referred to as pathological waste) consists of tissues, organs, body parts, blood and bodily fluids from patients, human foetuses and animal carcasses, but excludes teeth and hair.
Autoclaving	Refers to the method of exposing items, e.g. surgical instruments or laboratory waste, using an apparatus that creates steam under pressure for effective sterilization.
 Biohazard Symbol	This symbol is required on the side of all infectious and sharps waste containers.
Cleaning	Removal of contamination from an item to the extent necessary for further processing or for the intended use.
Clinical Staff	Includes all staff involved in and related to the observation and treatment of actual patients rather than theoretical or laboratory studies. <i>Examples: Nurses, Doctors, Phlebotomists, Dentists, etc.</i>
Chemical Waste	Consists of discarded solid, liquid and gaseous products that contain dangerous or polluting chemicals, for example from diagnostic and experimental work and from cleaning, housekeeping and disinfecting procedures. Chemical waste from health care may be hazardous or non-hazardous. <i>Examples: Pharmaceutical waste, Cytotoxic / genotoxic waste and radioactive waste.</i>
Colour-coding System	A system for relating the contents of packaging / containers by using different colours.
Containerization	Often used interchangeably with the word packaging. Refers to the materials used to wrap and safely contain the relevant waste streams to prevent exposure during transport until final disposal. <i>Examples: Rigid plastic containers, flexible plastic bags, lined fibre-board box sets, etc.</i>
Contaminated	State of having been actually or potentially in contact with a contaminant. <i>Examples: Pollutant, radioactivity, chemical, blood, etc.</i>
Decontamination	Process or mode of action to reduce contamination to a safe level.
Decontamination Area	Area of a health care facility designated for collection, retention and cleaning of soiled and/or contaminated items.

Genotoxic	Refers to a substance that is capable of interacting directly with genetic material, causing DNA damage that can be assayed. The term may refer to carcinogenic, mutagenic or teratogenic substances.
Hazard	Intrinsic potential property or ability of any agent, equipment, material or process to cause harm.
Hazardous Waste	Waste that may, by circumstances of use, quantity, concentration or inherent physical, chemical or toxicological characteristics, have a significant adverse effect on public health and/or the environment.
Health Care Facility	Place or site where professional health services are dispensed to human or animal patients or where biological research is carried out. <i>Examples: Laboratory, hospital, clinic, free-standing operating theatre, mobile clinic and health centre.</i>
Health Care General Waste	Comparable to domestic/municipal/household waste, this type of waste does not pose special handling problems or hazards to human health or to the environment.
Health Care Risk Waste	All waste generated by health care establishments, research facilities and laboratories that could pose a health risk to health workers, the public or the environment.
Identification	The process of visually recognizing relevant health care waste streams at the point of generation.
Infectious Waste	Waste that may have been in contact with human blood or bodily fluid and may have the ability to spread disease. <i>Examples: Gauze, cotton, dressings, laboratory cultures, IV fluid lines, blood bags, gloves, anatomical waste and surgical instruments.</i>
Infection Prevention Control (IPC) Staff	Infection Prevention Control Committee Members.
Laboratory Waste	Health care risk waste (HCRW) derived specifically from a laboratory environment, which includes all streams of HCRW in different forms and quantity depending on activities, as well as high volumes of the special waste category: Microbiological Waste - refer to definition below.
Microbiological Waste	Special waste category, which includes cultures and stocks of infectious agents and other specimens generated in high volumes from diagnostic or pathology laboratories. This waste category includes culture dishes (plates) and other growth media and devices used to transfer, inoculate and mix. Also includes discarded live and attenuated vaccines. It is also considered infectious waste but is isolated as a special waste category due to the special handling, packaging and treatment procedures warranted.
Microorganism	Entity of microscopic size, encompassing bacteria, fungi, protozoa and viruses.
Minimum Recommended Concentration (MRC)	Minimum concentration at which a liquid chemical sterilant is suitable for the decontamination procedure.

Mixed Waste (a.k.a. Combined Waste or Multihazardous Waste)	Waste with multiple types of hazardous constituents including contamination with radioactive waste and either infectious agents or hazardous chemicals or both. <i>Examples:</i> <ul style="list-style-type: none"> • <i>Aqueous radioactive waste with trace levels of chloroform or toxic heavy metals.</i> • <i>Radioactive methanol/acetic acid solutions from HPLC or gel rinse procedures.</i> • <i>Spent cocktail from continuous liquid scintillation counting.</i> • <i>Radioactive trichloroacetic acid solutions from protein precipitations.</i> • <i>Phenol/chloroform mixtures used to extract DNA from radio-labeled cells.</i> • <i>Spent chromic acid from critical cleaning of contaminated glassware contaminated with radioactive materials.</i> • <i>Vacuum pump oil contaminated with radioactive materials.</i> • <i>Chemical or radioactive waste containing blood products.</i> • <i>Mixed liquid waste from analyzers / equipment containing part water, part blood and part reagent.</i>
Packaging	Often used interchangeably with the word ‘containerization’. Refers to the materials used to wrap and safely contain the relevant waste streams to prevent exposure during transport until final disposal. <i>Examples: Rigid plastic containers, flexible plastic bags, lined fibre-board box sets, etc.</i>
Personal Protective Equipment (PPE)	Specialized clothing or equipment worn by an employee for protection against a hazard.
Segregation	Systematic separation of health care waste into designated categories.
Sharps Waste	Waste that may puncture the skin and cause disease. <i>Examples: Needles, infusion sets, scalpels, knives, blades lancets and broken glass.</i>
Sodium Hypochlorite Solution	Widely used for decontaminating surgical instruments, laboratory equipment and spot-disinfection of countertops and floors in health care facilities. <i>Example: Jik is the local trade name for concentrated sodium hypochlorite, which is sold widely.</i>
Special Waste	Comprised of hazardous and non-hazardous waste, which has physical or chemical characteristics, or both, that are different from anatomical/ infectious sharps/pathological, chemical, radioactive and general waste that requires special packaging and/or handling. <i>Example: Lead, batteries, mercury, pressured containers, infectious laundry, microbiological waste, infectious food waste, amputated limbs and electronic waste.</i>



Introduction

Intention?

This health care waste (HCWM) management-focused document was created for the following reasons and purposes:

- To supplement Swaziland's National HCWM Guidelines by providing further detail on an identified grey area in waste management for the sake of clarity, namely laboratory waste or waste generated in a laboratory environment.
- To provide more explicit and customized waste management guidelines for operators in a laboratory environment in particular.
- To address the uniqueness of the relevant health care risk waste (HCRW) streams emanating from the laboratory environment in question, and what adjustments need to be made from mainstream protocol without diverging from minimum standards (as laid out in Swaziland's National Guidelines on HCWM).
- To assist and inform the design of facility-level SOPs, job descriptions and workplace policies downstream.

This document does not:

- Preclude or replace a proper environmental management system (e.g. ISO accreditation).
- Preclude or replace a robust health and safety or safety, health and environmental management system.
- Preclude or replace facility-specific SOPs, job descriptions or workplace policies downstream.

This document is subject to change, improvement and/or exclusion (should it not suitably serve its purpose) during periodical reviews.

What Is Laboratory Waste?

Laboratory waste contains most of the components commonly classified as HCRW and should be segregated as directed by Swaziland's National HCWM Guidelines. Refer to Annex D for mainstream HCW streams and

packaging recommendations. However, laboratory waste does generate significant volumes of special waste categories that need special packaging/handling/treatment procedures and these need to be spelt out accordingly to assist laboratory staff in managing their waste correctly. For example, there is a higher load of chemical waste generated from this environment (such as reagents, dyes, and other chemicals, etc.), clinical glass (which should be treated as sharps waste in most instances) and culture plates (petri dishes) and stock cultures (broths) in large quantities which form part of the special waste category: microbiological waste, to name a few.

Laboratory waste in particular includes, but is not necessarily limited to:

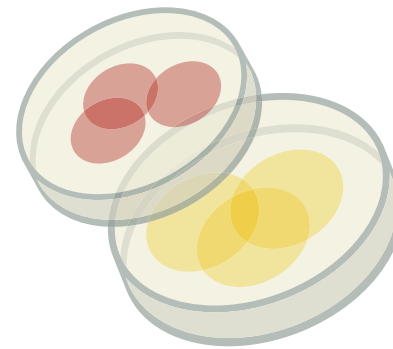

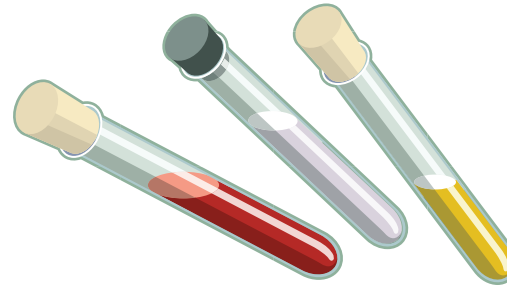

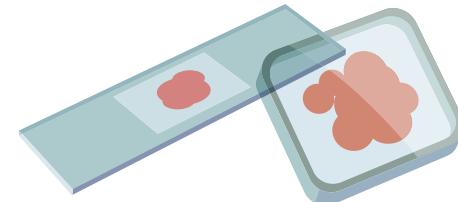

- **Waste cultures and stocks of agents** that are generated from a laboratory and are infectious to humans.
- **Discarded contaminated items** used to inoculate, transfer or otherwise manipulate cultures or stocks of agents that are infectious to humans.
- **Wastes from the production of biological agents** that are infectious to humans.
- **Discarded live or attenuated vaccines** that are infectious to humans.
- **Waste that originates from clinical or research laboratory** procedures involving communicable infectious agents unless such waste has been properly decontaminated by an approved process.
- **Mixed liquid wastes** derived from laboratory equipment / analyzers.

1. Waste Segregation

The separate streams of waste commonly identified in HCRW classifications should be applied as per Swaziland's National HCWM Guidelines, including colour-coding schemes. However, in some instances, laboratory waste is unique in the nature in which the waste is generated and in the volumes of relevant special streams. There are often multiple waste stream overlaps which cause confusion – for example, is a body organ in Perspex box preserved in formalin solution considered anatomical /pathological waste or chemical waste?

Here is a guide specifically targeted for the typical laboratory environment:

Waste Stream	Packaging Requirements In preparation for collection, transport, temporary storage and treatment/disposal
Sharps Empty vials 	 Puncture-proof, rigid plastic SHARPS container, appropriately labeled and colour-coded
Sharps Glass slides 	
Sharps Scalpel blades 	
Sharps/Infectious Culture stocks in glass tubes (Anatomical: High volume of blood / liquid) 	 Rigid plastic sharps container or red specbin with full and sealable, leak-proof lid. Frequent collection as not being preautoclaved. Small volumes, as glass is heavy.
Infectious Plastic pipettes 	 Thick red bag suitably sealed off with a cable tie once 3/4 full and labeled accordingly
Infectious Inoculation buds 	
Infectious Plastic vials 	

Waste Stream	Packaging Requirements In preparation for collection, transport, temporary storage, and treatment/disposal
 Infectious Petri dishes / culture plates (cracked or broken plates can perforate disposal bags)	 In some settings these are autoclaved prior to disposal to render them bacteriostatic. However, in settings where this is unachievable, it is advised that they be put into a red bag, sealed off with a cable tie once 3/4 full, double bagged and then put into a cardboard box which is closed, sealed and labeled accordingly. Collection frequency should be high, as many microorganisms will proliferate at room temperature.
 Infectious / Sharps Test tubes containing blood and/or bodily fluids. Since these tubes can be glass or plastic, they can potentially become sharp when cracked or broken and perforate bags, causing SPILL.	 Given their potential to be sharp and perforate bags causing high volume SPILL with bodily fluids, the volume generated is usually too high to warrant using sharps containers. Therefore, in the Swaziland context, it is advised to package them in the same way suggested for petri dishes: Put into a red bag, sealed with a cable tie once 3/4 full and then put into a cardboard box which is closed, sealed and labeled accordingly.
 Infectious / Sharps Pathological waste is human tissue and body parts removed by trauma, during surgery, autopsy or studies and which are intended for disposal (not including teeth, hair or nails). Fixed pathological wastes are not infectious. Unfixed pathological wastes are.	 Pathological waste fixed to glass slides must be disposed of as sharps waste into a puncture-proof, rigid plastic sharps container, appropriately labeled and colour-coded. Unfixed pathological waste should be disposed of in a rigid plastic specbin with sealable, leak-proof lid.

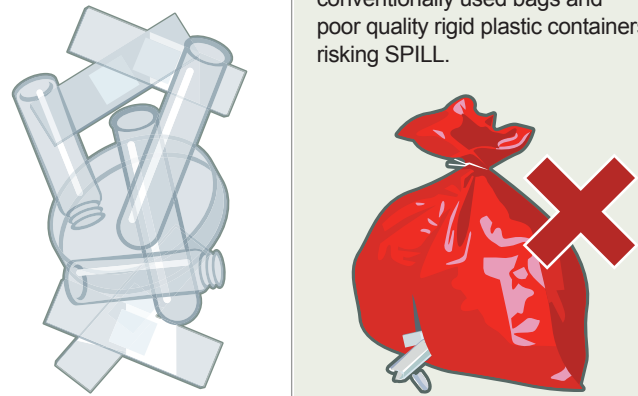
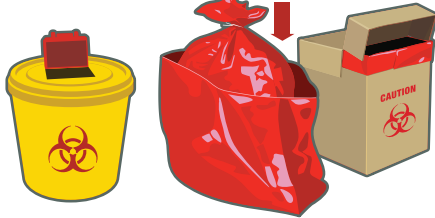
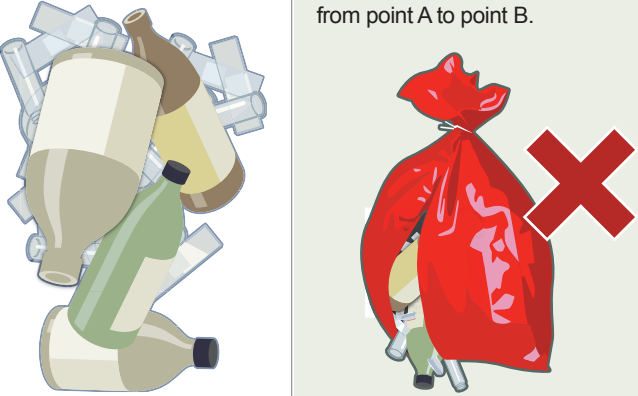

Refer to Annex D for the Mainstream HCW streams poster.
Refer to Annex E for a customized visual aid for laboratory waste identification, segregation and packaging.

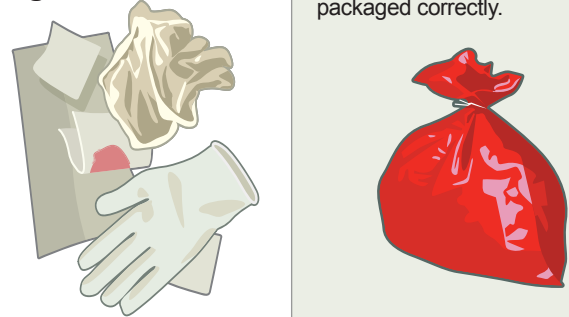



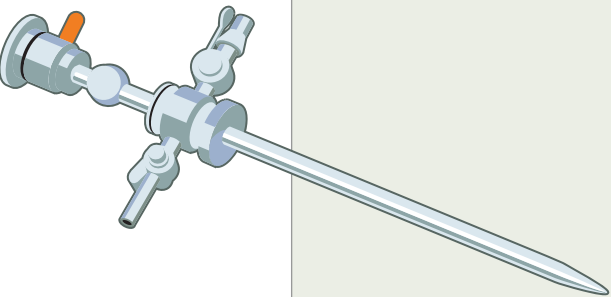
2. Packaging / Containerization

Refer to the table in Section 1. Always use discretion based on the following:

- Is the waste generated in high or low volume?
- Is the waste wet or dry?
- Is the waste heavy or light?
- Is the waste potentially sharp?

Always keep in line with suggested packaging requirements such as labeling and colour-coding and take note of the following:

Waste is:	Packaging and Containerization Challenges	Packaging Considerations
<p>Potentially sharp when broken</p> 	<p>Plastic or glassware can crack or break during transit rendering sharp edges, which can penetrate conventionally used bags and poor quality rigid plastic containers risking SPILL.</p>	<p>In most cases, anything that is potentially sharp should be treated as sharps waste, warranting a puncture-proof, sealable rigid plastic container. If volumes are too high to warrant the use of sharps containers, then improvise by double bagging and using lined box sets so that the contents are protected from breakage during transit and the likelihood of sharp edges poking through is minimized, for example. Labels clearly indicating the contents of the packaging inform waste handlers how to handle it.</p> 
<p>Heavy Glassware or liquids in high volumes, limbs, etc.</p> 	<p>Packaging / container can break under load risking SPILL. Waste handlers can injure themselves trying to lift and carry the waste from point A to point B.</p>	<p>Use smaller containers (in volume or capacity) that can withstand relative load. Smaller containers are easier to lift and carry. Use good quality packaging that can withstand load or improvise with double-bagging, etc.</p> 

Waste is:	Packaging and Containerization Challenges	Packaging Considerations
<p>Light</p> 	<p>No additional risk posed if packaged correctly.</p>	<p>Can use larger volume containers or bags.</p> 
<p>Wet</p> 	<p>Liquid poses the risk of seeping or spilling out of the container. Liquid waste in high volumes can be heavy.</p>	<p>Container / packaging needs to be leak-proof and obviously should be liquid-proof (a cardboard box would not be suitable, for example, as it would fall apart when wet unless well-lined and protected from liquid).</p>
<p>Dry</p> 	<p>No additional risk posed if packaged correctly.</p>	<p>Can use lightweight packaging or bags as no risk of leakage or seepage.</p>
<p>Clumsy, large or oddly-shaped</p> 	<p>Waste stream in question is too large or oddly shaped to fit into conventional HCRW packaging.</p>	<p>Examples include long sharps such as trocars or amputated limbs. Select the right-sized container for the waste stream. If it doesn't fit, or you can't find a container to fit the waste, don't try and fit it in because if the container cannot close and seal properly it defeats the object of SAFE CONTAINMENT and puts handlers downstream at risk. Improvise where necessary, taking into account the nature of the waste and prescribed colour-coding and labeling requirements.</p>

3. Storage Requirements

As per the national guidelines, the following criteria should apply in all instances:

- The waste storage site (WSS) shall be clearly demarcated as such.
- The WSS has to have sufficient capacity to store all waste according to your unique waste generation profile (in line with agreed collection schedules), and for temporary stockpiling during a strike or other unforeseen emergency situation.
- It should be a sheltered enclosure to protect it from sun, rain and other elements.
- It should be well ventilated in order to maintain the lowest possible ambient temperature to combat the potential of odour nuisance and accelerated decomposition.
- The floor of the WSS should be impermeable, slip-resistant and hard standing to facilitate easy cleaning.
- The WSS should be suitably equipped with a proximal water source to facilitate cleaning, as well as good drainage, which connects to the sewer.
- The WSS should be well lit.



PPE (Personal Protective Equipment)



Recommended signage for waste storage site

- This WSS enclosure should boast a lockable door to prevent access by children and unauthorized persons as well as scavenging animals or birds. Storage areas may be secured by use of locks on entry doors, gates and/or receptacle lids.
- It should be convenient and easy to use and accessible at all times to waste collection vehicles.
- The WSS should be in a location where there is low public presence/passage.
- It should be equipped with a fire extinguisher.
- A staff member to whom the duty of managing & maintaining the WSS is allocated to should be suitably equipped with the necessary PPE, which should include: gumboots, work uniform, elbow length PVC gloves (or similar alternative), mask, protective eye goggles and an apron.
- Chemical waste has been isolated in its own section further in this document.

4. Collection Frequency

Collection frequency should be negotiated and in keeping with a turnaround time that does not leave HCRW stored for any prolonged period. Please refer to WHO storage guidelines as follows:

Unless a refrigerated storage room is available, storage times for health care waste (i.e. the delay between production and treatment) should not exceed the following:

Temperate Climate	72 hours in Winter 48 hours in Summer
Warm Climate	48 hours in the cool season 24 hours in the hot season

SANS 10248 (the South African National Standard for HCWM) presents these recommendations.

Waste ^a	Time Limits
Anatomical/Pathological ^b	24 hours
Infectious ^b	72 hours
Sharps Container	30 days
Pharmaceutical	90 days

^aContainers shall be sealed
^bThe waste may be stored at -2° C for 90 days.

Note: Cytotoxic waste should be stored separately from other health care waste in a designated secure location. Radioactive waste should be stored in containers that prevent dispersion, behind lead shielding. Waste that is to be stored during radioactive decay should be labeled with the type of radionuclide, the date and details of required storage conditions.

5. Spill Management

5.1 Various Forms of Hazardous Waste

- Solids / Sharps
- Dusts
- Fumes
- Liquids
- Vapours
- Mists
- Gases

The above dictates the necessary actions, precautions and PPE that should be enlisted during spill cleanup procedures. Spill management should be proactive rather than reactive – you should prepare for ALL types of spills and have a team of staff trained in spill cleanup procedures.

5.2 A Spill - First Steps

- Upon finding a spill, we ask that you behave in a timely manner to minimize your exposure.
- Go to a safe area and keep others away from the spill.
- Do NOT turn on or off the lights (as they may be an ignition source if flammable substances are involved).
- Call your supervisor and ask them to contact any of the spill reaction team (internally trained team).
- Be prepared as you will need to provide as much information as possible:
 - ✓ Your name as a point of contact.
 - ✓ Location of the spill including building name, room number, location in the room and anything else you feel to be of assistance.
 - ✓ Description of the spill including contents, amount, color, odor and possible causes of the spill.

5.3 Spill Management

Infectious Waste - DRY SPILL

1. Collect dry spill with brushes, pans or other suitable equipment.
2. Place collected dry spill into a red bag.
3. Decontaminate spill area by carefully spraying the area with a sodium hypochlorite solution and wiping the area dry with cloths/paper towels. Repeat until all contaminants are visibly removed and the area is dry.
4. Place used cloths/paper towels into a red bag and close securely.
5. Take red bags to designated waste storage area.
6. Dispose of or decontaminate all PPE or equipment used.

Infectious Waste - WET SPILL (Blood & bodily fluids)

1. Place cloths/paper towels or suitable absorbent on wet spill to absorb it (approximately 5 minutes).
2. Carefully collect saturated cloths/paper towels or absorbent material and place into a red bag.
3. Continue to carefully wipe the area with cloths/paper towels until all visible contaminants are removed.
4. Place used cloths/paper towels into red bag.
5. Decontaminate spill area by carefully spraying the area with a sodium hypochlorite solution and wiping the area dry with cloths/paper towels. Repeat until all contaminants are visibly removed and the area is dry.
6. Place used cloths/paper towels into the red bag and close securely.
7. Take red bags to designated waste storage area.
8. Dispose of or decontaminate all PPE or equipment used.

Infectious Waste - SHARPS SPILL

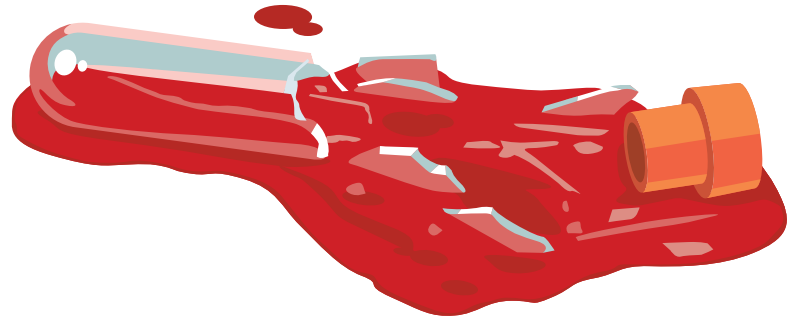
1. Collect the sharps with a brush and long handled dust pan or other suitable equipment. **NEVER PICK UP SHARPS WITH HANDS.** Use forceps / tweezers where necessary.
2. Place collected sharps into a sharps container and close securely.
3. Decontaminate spill area by carefully spraying the area with a sodium hypochlorite solution and wiping the area dry with cloths/paper towels. Repeat until all contaminants are visibly removed and the area is dry.
4. Place used cloths/paper towels into a red bag and close securely.
5. Take the sharps container(s) and red bag to designated waste storage area.
6. Dispose of or decontaminate all PPE or equipment used.

CHEMICAL SPILL

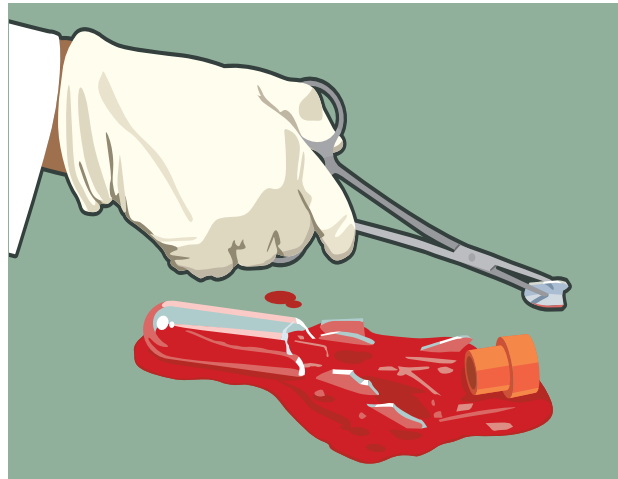
1. Consult the **Material Safety Data Sheet (MSDS)** issued with the chemical in question for guidance.
2. Collect chemical spill with suitable equipment, as directed by the **MSDS**.
3. Place contaminated materials into a green bag or green container (where applicable) and close securely, as per **MSDS**.
4. Once spill is cleared, decontaminate spill area as per **MSDS**.
5. Take green bag/container to designated waste storage area.
6. Dispose of or decontaminate all PPE or equipment used.

Refer to Annex F for a visual aid on spill management.

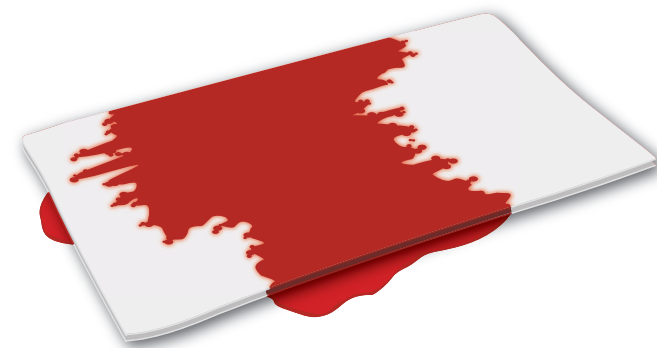
5.4 General Blood Cleanup Guide



A blood-spill requires immediate attention. Don appropriate PPE gloves, mask and eyewear.



Use forceps to pick up broken glass.



Lay absorbent material over blood spill.



With gloved hands, remove saturated absorbent material carefully.



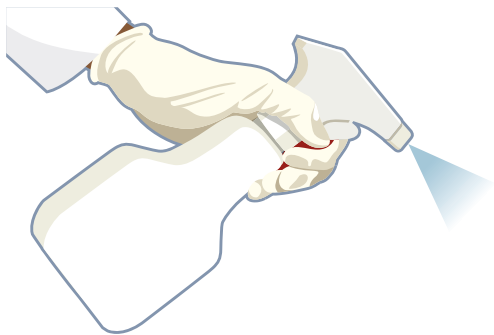
Carefully dispose of saturated absorbent material in a red, bio-hazardous, 100 micron waste bag.



Spray or gently pour disinfectant on spill area (while continuing to wear PPE to prevent splash in eyes and inhalation). In general, decontaminate surfaces on-the-go.



Wipe up residual spill with a paper towel.



Spray or gently pour on disinfectant for final soak.



1. GLOVE REMOVAL & DISPOSAL
Grip one glove near the cuff and peel it down until it comes off inside out. Cup it in the palm of your other gloved hand. Place two fingers of your bare hand inside the cuff of the remaining glove.



2. GLOVE REMOVAL & DISPOSAL
Peel the glove down so that it comes off inside out and over the first glove. Dispose of the gloves correctly!



With all spills...

- ✓ Ensure that **universal precautions** are observed.
- ✓ Provide **free Hepatitis-B vaccination** series.
- ✓ Provide all **necessary PPE** and ensure that it is **used**.
- ✓ Provide **BBP training**, and annually thereafter.
- ✓ Maintain **records of all training**.
- ✓ Maintain an **exposure control plan**, update annually
- ✓ **Record exposure incidents** and follow-up activities.

5.5 Vaccine Spill Cleanup

● Wipe-down

Vaccine spills are handled by wiping down the area with a 0.5% solution of hypochlorite (bleach and water solution) or some other standard laboratory bench top cleaner. You may also clean vaccine spills with a tuberculocidal agent.

● Disposal

Dispose of materials used to clean a vaccine spill in a red bag.

5.6 Chemical Spill Procedure

Refer to Section 6, Chemical Waste Management.

5.7 Spill Prevention Behaviour

- Always stay alert while working in a lab or around any type of chemical.
- Watch for bottles / containers sitting on the edges of counters and look for items sitting on floors that could be kicked over.
- Watch for electrical cords or plastic tubing, as these may be items that could jiggle enough to knock something over.
- Watch where the end of long handles are.
- Do not push carts through tight areas where items protruding from the cart could inadvertently knock something over. Don't block yourself into a corner with your cart - if something happens, you need a clear path to get out safely.
- Never try to reach into an area where you can't see what is present. Often, things are purposely set in out of the way places.

- Place your sharps waste receptacles in a secure and accessible position, which decreases the likelihood of accident.
- Segregate your waste correctly using the correct containers.
- Look for tears in waste bags before removing them. Look for any liquids that may leak through the bag. Another common thing to look for is fine powder that may be sprayed from the sack with air.
- The most important thing in laboratory safety: **DON'T TOUCH ANYTHING.**

5.8 Reduce Risk!

5.8.1 Work Practice Controls

- Don't recap / resheath or denotch needles.
- Do not pick up sharps with hands.
- Ensure sound equipment & surfaces decontamination.
- Do not eat, drink or apply cosmetics in the work area.
- Regular and effective hand washing is critical.

5.8.2 Engineering Controls

- Needles and other sharps need to be disposed of in a rigid, leak-proof, puncture-resistant **sharps waste container**, appropriately labeled as such.
- **Safe medical devices** – retractable needles, etc.
- **Clean-up / Spill kits** fully stocked and accessible with clear use instructions.
- **Red, 100 micron, hazardous waste bags**, always available (fully-stocked).

5.9 Blood-borne Pathogen Spill Kit

All laboratories should have a **spill kit**. All employees should **know where the spill kit** is located and how to use it. Discuss specifics with your supervisor. It should contain the following items:

- **Absorbent material** (fluid control solidifier) to manage up to 40 litres of fluid
- **4 litres** hospital grade **disinfectant** and a **spray bottle**
- Many large **red, 100 micron, biohazard bags**
- 2 sets of **disposable coveralls, boots, caps**
- 2 pairs of heavy neoprene **gloves**
- 2 pairs of **eye** (goggles) and **respiratory protection devices**
- Tools for mechanical means of picking up sharps (e.g., tongs, dustpans, forceps, etc.)
- 90 metres of **boundary marking tape**, plus 1 roll of **packing tape**
- Disposable rigid plastic **sharps waste container**.
- Other personal safety equipment cleaning pads.
- **First aid kit** (facilities with an emergency room exempt)



5. Chemical Management

6.1 Excess Chemical Product

- Excess commercial products that are not used for their intended purposes are **hazardous wastes** if they meet certain criteria defined by relevant environmental laws.
- When a container is emptied by using the chemical for its intended purpose, it may be thrown away in general waste (**PLEASE destroy any container that has held chemicals - so other people cannot use it**).
- Dumping large volumes of chemicals that are hazardous wastes down the drain is **ILLEGAL**. You should always consult with Swaziland Water Services Corporation (SWSC) before disposing of any concentrated or diluted chemical down the drain.

6.2 Important Notes on Chemicals

- Some of the chemicals you use will eventually **become hazardous** wastes.
- **ALWAYS label** containers that hold chemicals correctly.
- **Never put chemicals in mislabeled** containers. Unknown chemicals can cost a fortune in analysis for disposal.
- Good labeling will consist of the **chemical contents** (and **brand name** if available), **expiration date** (if known), and the **CAS number** of the chemical.
- Labels such as "Organic Waste", "Xylene Waste" etc. are not recommended. Label these as "Used Xylene" etc. that can be redistilled or put to other uses.
- A **Materials Safety Data Sheet (MSDS)** for each chemical in stock should be kept in a file on site for easy reference.

6.3 Packaging Chemical Waste

6.3.1 General

- Chemical waste intended for transportation outside of a health care facility shall be classified in accordance with relevant standards and regulations. A good reference is also SANS 10228 as well as SANS 10229-1 or SANS 10233 for packaging.
- Chemical waste should be sorted into the different hazard classes and then divided into chemical, pharmaceutical or genotoxic / cytotoxic waste, as applicable. Hazardous chemical waste of different classes should never be mixed (refer to Annex A).
- The packaging, wherever practicable, should be clearly colour-coded dark green and labeled, the lettering of which should be of a size, style and layout



Suggested label for chemical waste

that is clearly legible. The colour of the surface area immediately surrounding the label shall contrast with the background of the label.

- Chemical waste may be placed in empty containers that originally contained the same type of chemical, provided that the original label is removed or clearly defaced and a new label is created indicating what the contents are and that it is waste.
- A thorough inventory should be taken of chemical waste and an example of such an inventory is presented in Annex C.

6.3.2 Storage

- Do not store waste in a fume hood where reactions are being carried out.
- If reaction gets out of control, the waste bottle could explode and lead to a fire or mixing of incompatible chemicals. Remove waste bottles from hoods where reactions are being carried out.
- Do not use metal cans for waste.
- Even near neutral pH, solids and liquids can corrode through metal cans. Use only glass or hard plastic containers for waste.
- Do not store flammable waste containers on a bench or floor. Store waste containers in an explosion-resistant solvent cabinet.
- Do not store waste bottles in a sink or floor drain.
- Toxic chemicals can enter the sewer and emit toxic gas causing health hazard or explosion.

Refer to Annex B for a list of compatible versus incompatible chemicals, which can or cannot be stored together, as well as the potential reactions if incompatible chemicals are mixed.

6.3.3 Chemical Spill Management

There are several different kinds of chemicals available on the market, some compatible with each other and others not. It is near impossible to give explicit guidelines in one document with regards to handling chemical waste. It remains the responsibility of the person or department procuring specific chemicals

for particular functions to ensure that they acquire a **MSDS** for each chemical from the manufacturer, supplier or internet, and investigate, educate and display handling, spill and disposal management procedures accordingly.

IMPORTANT: You need to be **PREPARED** for spills (proactive versus reactive) and familiarize yourself with each chemical's **MSDS BEFORE** using the chemical in question.

Example: Procedures for the management of Hydrochloric Acid

1. Evacuate the area and inform the managerial staff/Infection Prevention Control immediately.
2. Review the **MSDS** or prepared protocol to determine the appropriate action to be taken.
3. Put on the required PPE as stated in the **MSDS** or prepared protocol including utility gloves, apron, rubber boots and face protection (goggles or full-length face shields).
4. Open all windows and doors to ventilate area.
5. Neutralize with alkaline material (soda ash, lime).
6. Absorb with an inert material (e.g., vermiculite, dry sand and/or earth).
7. Place waste material in a dark green specbin and store according to HCWMSOP003 Waste Storage.

MSDS for Hydrochloric Acid states:

SPILL Management:

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e.g., vermiculite, dry sand, earth) and place in a chemical waste container. Do not use combustible materials, such as sawdust. Do not flush to sewer!

Disposal:

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Storage:

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

Refer, also, to Annex F, a visual aid for spill management

Annexure

Annex A: Hazard Classes and Symbols

A.1 Hazard Classes & Labels

A.1.1 Class 1: Explosives

Explosives of class 1 are regulated by the relevant requirements and regulations of the current relevant national legislation. The classification, transportation and disposal of explosives shall be approved by the relevant competent authority.

NOTE: Class 1 is included for the sake of completeness since it is unlikely that class 1 waste will be generated from a health care facility.



A.1.2 Class 2: Gases

This class is subdivided as follows:

- Division 2.1: Flammable gases
- Division 2.2: Non-flammable and non-toxic gases
- Division 2.3: Toxic gases



A.1.3 Class 3: Flammable Liquids

This class comprises liquids with a closed-cup flash point not exceeding 60.5° C.



A.1 Hazard Classes & Labels (cont.)

A.1.4 Class 4: Flammable Solids

This class is subdivided as follows:

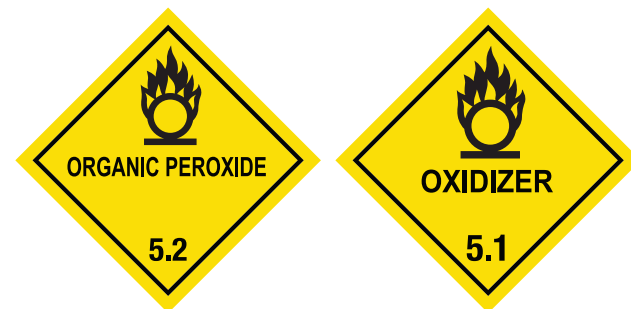
- Division 4.1: Flammable solids
- Division 4.2: Substances liable to spontaneous combustion
- Division 4.3: Substances that, on contact with water, emit flammable gases



A.1.5 Class 5: Oxidizing Substances

This class is subdivided as follows:

- Division 5.1: Oxidizing substances
- Division 5.2: Organic peroxides



A.1.5 Class 6: Toxic Substances

This class is subdivided as follows:

- Division 6.1: Toxic substances
- Division 6.2: Infectious substances



A.1.7 Class 7: Radioactive Material

This class comprises materials that spontaneously emit ionizing radiation.



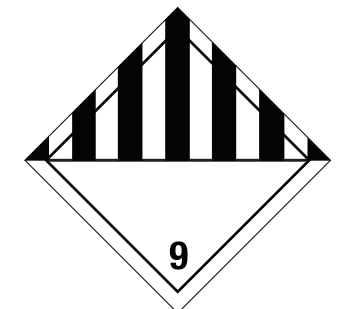
A.1.8 Class 8: Corrosives

This class comprises substances that, by chemical action, cause damage to living tissue, to commonly used metals or to other packaging.



A.1.9 Class 9: Miscellaneous Dangerous Substances

This class comprises any substance not covered by the other classes, but that has been or could be shown by experience to be of such dangerous character that the provisions of this class should apply to it.



A.1 Hazard Classes & Labels (cont.)

International Symbol for Biological Hazards in General



International Symbol for Cytotoxic Waste



Annex B: Chemical Storage

B.1 Chemicals that can and can't be mixed for waste storage

Waste Category	Compatibility Examples (OK to mix category items in same waste container bottle)
Flammable solvents	Acetone, methanol, ethanol, toluene, xylene, acetonitrile, benzene, etc.
Halogenated solvents	Halothane, methylene chloride, chloroform, carbon tetrachloride, trichloroethane, trichloroethylene
Organic acids	Formic acid, acetic acid, propionic acid
Waste Category	Incompatibility Examples (Do not mix category items in same waste container bottle)
Heavy metal solutions	Aqueous solutions containing arsenic, barium, cadmium, chromium, copper, lead, mercury, osmium, selenium, silver, etc.
Mineral acids	Hydrochloric acid, nitric acid, sulphuric acid, perchloric acid
Inorganic bases	Sodium hydroxide, potassium hydroxide, ammonia
Oxidizers	Potassium nitrate, hydrogen peroxide, potassium permanganate, bleach
Reactive wastes	phosphorus pentoxide, sodium hydride, sodium methoxide, dry picric acid

B.2 Incompatible Chemicals

Substance	Incompatible with
Acetic acid	Chromium oxide, nitric acid, perchloric acid, peroxides, permanganates, alcohol, ethylene glycol
Acetic anhydride	Hydroxyl-containing compounds e.g. ethylene glycol, perchloric acid
Acetone	Concentrated nitric acid and sulphuric acid mixtures, hydrogen peroxide
Activated carbon	Calcium hypochlorite, oxidizing agents
Alkali metals	Water, carbon tetrachloride and other halogenated alkanes, carbon dioxide, halogens. Do not use water or foam extinguishers for fires involving these metals Use the appropriate class D extinguisher.
Aluminum	All oxidizing agents, acids, alkalis, halogenated hydrocarbons, peroxides
Aluminum alkyls	Water
Ammonia, liquid or gas	Mercury (e.g. in pressure gauges), chlorine, calcium hypochlorite, iodine, bromine, hydrogen fluoride
Ammonium nitrate	Acids, powdered metals, flammable liquids, chlorates, nitrates, sulfur, fine-particulate organic or combustible materials
Aniline	Nitric acid, hydrogen peroxide

Substance	Incompatible with
Arsenic materials	Any reducing agent
Azides	Acids
Bromine	See chlorine
Calcium oxide	Water
Carbon activated	Calcium hypochlorite, other oxidants
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane, hydrogen, petroleum benzene, benzene, powdered metals
Chlorates	Ammonium salts, acids, powdered metals, sulfur, fine-particulate organic or combustible substances
Chromium (VI) oxide, chromic acid	Acetic acid, naphthalene, camphor, glycerol, petroleum benzene, alcohols, flammable liquids
Copper	Acetylene, hydrogen peroxide
Cumenehydroperoxide	Acids, both organic and inorganic
Cyanides	Acids
Flammable liquids	Ammonium nitrate, chromium (VI) oxide, hydrogen peroxide, nitric acid, sodium peroxide, halogens, chromic acid.
Fluorine	Extremely aggressive. Store separately and isolate from everything!
Hydrazine	Hydrogen peroxide, nitric acid, any other oxidant
Hydrocarbons	
Butane, propane, benzene etc.	Fluorine, chlorine, bromine, chromium (VI) oxide, sodium peroxide
Hydrogen fluoride	Ammonia (laboratory gas or solutions)
Hydrogen peroxide	Copper, chromium, iron, metals and metal salts, alcohols, acetone, organic substances, aniline, nitromethane, combustible substances (solid or liquid)
Hydrogen sulphide	Fuming nitric acid, oxidizing gases
Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (laboratory gas or solutions)
Mercury	Acetylene, ammonia
Nitrates and nitrites	Acids
Nitric acid	Acetic acid, aniline, chromium (VI) oxide, prussic acid, hydrogen sulfide, flammable liquids and gases

Substance	Incompatible with
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury, mercury salts
Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohols, paper, wood, grease, oil, all organics
Peroxides, organic	Acids (organic and inorganic), avoid friction, store cold.
Phosphorus	Acids (organic and inorganic), avoid friction, store cold.
Phosphorus pentoxide	Alcohols, strong bases, water
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	see chlorate
Potassium perchlorate	see chlorate
Potassium permanganate	Glycerol, ethylene glycol, benzaldehyde, sulfuric acid
Silver	Acetylene, oxalic acid tartaric acid, ammonium compounds
Sodium	see alkali metals
Sodium peroxide	Methanol, ethanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerol, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulphides	Acids
Sulphuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate
sulphur	Metals, all oxidizing agents
Zinc	Zinc

B.3 Reactions that can occur

Chemicals Stored Together	Possible Reaction
Acetic acid & acetaldehyde	Small amounts of acetic acid will cause the acetaldehyde to polymerize, releasing heat.
Acetic anhydride & Acetaldehyde	Reaction can be violently explosive.
Aluminum metal & ammonium nitrate	A potential explosive.
Aluminum & bromine vapor	Aluminum foil reacts with bromine vapor at room temperature and incandesces.
Ammonia vapor & bromine vapor	Unstable nitrogen tribromide is formed; explosion may result.

Chemicals Stored Together	Possible Reaction
Ammonium nitrate & acetic acid	A mixture may result in ignition, especially if acetic acid is concentrated.
Cupric sulfide & cadmium chlorate	Will explode on contact.
Hydrogen peroxide & ferrous sulfide	Forms a vigorous, highly exothermic reaction.
Hydrogen peroxide & lead II or IV oxide	Violent, possibly explosive reaction.
Lead perchlorate & methyl alcohol	Forms an explosive mixture if agitated.
Lead sulfide & hydrogen peroxide	Vigorous, potentially explosive reaction.
Mercury II nitrate & methanol	May form mercury fulminate - an explosive.
Nitric acid & phosphorus	Phosphorus burns spontaneously in the presence of nitric acid.
Potassium cyanide & potassium peroxide	A potentially explosive mixture if heated.
Sodium nitrate & sodium thiosulfate	A mixture of the dry materials can result in an explosion.

B.4 References for Annex B Tables

Merck Chemical Company
 Chemical Safety Office, Risk Management Department, University of Vermont
 Hazards in the Chemical Laboratory, 4th. edition. 1986. Bretherick.

Annex C: Example of Inventory List for Chemical / Pharmaceutical Waste

Contents of Container	Codorol tubs of 1000 tabs
No. of Containers	1
Packaging Type*	C
Qty of Items in Container	32
Total Weight of Container (kg)	23.34
Waste Classification**	P
Physical Nature***	S
Disposal Method	Waste Immobilization (Inertization) or Incineration
Notes	Each Codorol tab contains: Paracetamol 500mg; Codeine Phosphate 8mg; Sodium Metabisulphite 0.08% m/m



* **C** Cardboard Box 40 litre
RP Red Plastic Bag 60 litre
WP White Plastic Bag 60 litre
RSS Red Specbin Small 5 litre
RSL Red Specbin Large 25l litre

** **C** Chemicals
P Pharmaceuticals
O Other

*** **S** Solid
L Liquid
G Gas Cylinder
M Mixed Product

Annex D: Poster 1

Waste Category and Colour-Coding Table

WASTE CATEGORY	GENERAL WASTE	INFECTIOUS WASTE (NON-ANATOMICAL, NON-SHARPS)	INFECTIOUS ANATOMICAL PATHOLOGICAL WASTE (a)		SHARPS WASTE	CHEMICAL WASTE			RADIOACTIVE WASTE	PRESSURIZED CONTAINERS	HEAVY METAL	ELECTRONIC WASTE	SPECIAL WASTE			
Sub-Category	None	None	Infectious Human	Infectious Animal	None	Chemical	Pharmaceutical	Genotoxic/ Cytotoxic	None	None	None	None	Highly Infectious Laundry	Microbial Waste	Food Waste From Isolation Ward	Amputated Limbs
Colour-Coding	Black or Transparent	Red	Red	Orange	No Colour Specified / Yellow	Dark Green	Dark Green	Dark Green	No Colour Specified	Black	No Colour Specified	No Colour Specified	Red	Red	Red	Red
Label/Symbol	None	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly	Label: "Danger Contaminated Clinical Sharps" in red text with biohazard label	Use appropriate hazard symbol and label correctly	Use appropriate hazard symbol and label correctly	Use appropriate hazard symbol and label correctly	Use appropriate hazard symbol and label correctly	Use appropriate hazard symbol and label correctly	Use appropriate hazard symbol and label correctly	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly	Use biohazard symbol and label correctly
Container/ Packaging	Good quality black or transparent bag (c)	Heavy-duty leak-proof red plastic bag	Heavy-duty leak-proof red plastic bag; or lined fibre-board box, or red, rigid plastic specbin	Heavy-duty leak-proof orange plastic bag	Sealable, puncture-proof, rigid plastic container for sharps	Sealable, puncture-proof green rigid plastic container	Sealable, puncture-proof green rigid plastic container	Sealable, puncture-proof green rigid plastic container	Contact the Swaziland Environmental Authority for further information	Good quality black bag labeled "waste pressurized containers" or "waste aerosol dispensers"	Refer to facility-specific, element-specific Standard Operating Procedure	Put into boxes sealed and labeled accordingly	Heavy-duty leak-proof bag or rigid plastic container	Fibre board box set lined with heavy duty, leak-proof red plastic bag	Double-bag and put into a Fibre board box set lined with heavy duty, leak-proof red plastic bag	Double-bag and put into a Fibre board box set lined with heavy duty, leak-proof red plastic bag
Treatment/ Destruction/ Disposal	Landfill or recycle	Dedicated secure waste pit/ incineration/ approved alternative technology	Dedicated secure waste pit/ incineration/ approved alternative technology	Dedicated secure waste pit/ incineration/ approved alternative technology	Dedicated secure waste pit/ incineration/ approved alternative technology	Transport to Central Medical Store (CMS) for incineration/ hazardous waste landfill	Transport to (CMS) for incineration/ hazardous waste landfill	Transport to (CMS) for incineration/ hazardous waste landfill	Radioactive waste disposal site	Transport to CMS for specialized recovery/ hazardous waste landfill	Transport to CMS for specialized recovery or disposal/ hazardous waste landfill	Transport to suitable alternative collection facility for recovery, recycling and/or specialized disposal	Dedicated secure waste pit/ incineration	Dedicated secure waste pit/ incineration/ approved alternative technology	Dedicated secure waste pit/ incineration/ approved alternative technology	Dedicated secure waste pit/ incineration/ approved alternative technology

(a) Chemical or radioactive solutions containing human or animal anatomical and infectious wastes are considered as chemical or radioactive waste respectively.
 (b) Black, white or transparent packaging can be used.
 (c) Transparent bag is recommended for health care facility so that if hazardous waste slips into the general waste stream it can be easily identified by visual assessment before handling.

For detailed guidelines, please refer to the Swaziland National Health Care Waste Management Guidelines, February 2013, and SANS 10248 - Management of Health Care Waste in Health Care Facilities.

Annex E: Poster 2

Quick Guide to Disposing Laboratory Waste

PACKAGING REQUIREMENTS RELATIVE TO NATURE OF WASTE

- HEAVY:** Use smaller volume containers/packaging that accommodate weight and can be comfortably carried
- LIGHT:** Use higher volume container/packaging
- WET:** Use sealable, LEAK-proof container/packaging
- DRY:** Use sealable container/packaging
- SHARP OR POTENTIALLY SHARP WHEN BROKEN:** Use sealable PUNCTURE-proof container/packaging

		SUGGESTED CONTAINERS	COLLECTION FREQUENCY	TREATMENT/DISPOSAL OPTIONS
GENERAL Uncontaminated packaging, office supplies, beverage containers, hand towels, boxes, glass/plastic bottles, food, cardboard, cling wrap, food wrap	● ●	THICK TRANSPARENT/BLACK BAG, SUITABLY SEALED WITH A CABLE-TIE WHEN 3/4 FULL	DETERMINED BY VOLUME AND STORAGE CAPACITY	LANDFILL
SHARPS ALSO INFECTIOUS				
Empty Glass Vials	● ● ● ●			
Scalpel Blades	● ● ● ●		WITHIN 30 DAYS	SECURE PIT OR INCINERATE OR TREAT WITH APPROVED ALTERNATE TECHNOLOGY
Fixed (to glass slides) Pathological Waste	● ● ● ●	FOR ALL SHARPS USE PUNCTURE-PROOF, RIGID PLASTIC SHARPS CONTAINER APPROPRIATELY LABELED AND COLOUR-CODED		
Glass Slides or Clinical Glass	● ● ● ●			
Culture Stocks, Blood and/or Body Fluids Contained in Glass Test Tubes	● ● ● ●			
INFECTIOUS NON-SHARPS				
Inoculation Buds	● ● ● ●			SECURE PIT OR INCINERATE OR TREAT WITH APPROVED ALTERNATE TECHNOLOGY
Plastic Vials	● ● ● ●	THICK RED BAG, SUITABLY SEALED WITH A CABLE-TIE WHEN 3/4 FULL, APPROPRIATELY LABELED AND COLOUR CODED	AUTOCLAVE AND DISPOSE OF WITHIN 3 DAYS	
Plastic Pipettes	● ● ● ●			
Petri Dishes / Culture Plates	● ● ● ●		WITHIN 3 DAYS	
Plastic Test Tubes Containing Blood and/or Bodily Fluids	● ● ● ●	IF A SEALABLE, LEAK-PROOF, RIGID PLASTIC CONTAINER IS UNAVAILABLE, DOUBLE-BAG WITH A THICK RED BAG. SUITABLY SEAL WITH A CABLE TIE WHEN 3/4 FULL. PLACE INTO A SUITABLE FIBRE-BOARD BOX, APPROPRIATELY TAPED SHUT AND LABELED.	IF NOT AUTOCLAVED PRIOR TO DISPOSAL, COLLECTION FREQUENCY MUST BE HIGHER	
Fixed and Unfixed Pathological / Anatomical Waste or Human Tissue (biopsies) and Body Parts (does not include teeth or hair)	● ● ● ●	SEALABLE, LEAK-PROOF, RIGID PLASTIC CONTAINER, APPROPRIATELY LABELED AND COLOUR CODED	WITHIN 3 DAYS OR UP TO 90 DAYS IF STORED AT -2°	
CHEMICAL Used, Contaminated, or Unused / Expired Chemicals Including used acetone, hydrochloric acid contaminated with heavy metals, sodium hydroxide solution, reagents, etc.	→	FOR SPILL MANAGEMENT, PACKAGING, DISPOSAL AND FIRST AID GUIDELINES REFER TO THE MATERIAL SAFETY DATA SHEET (MSDS) WHICH IS, BY LAW, ISSUED WITH EVERY CHEMICAL MANUFACTURED AND SOLD ON THE MARKET. ALTERNATIVELY, CONSULT WITH SUPPLIER, MANUFACTURER, SEA (SWAZILAND ENVIRONMENTAL AUTHORITY) OR HAZARDOUS WASTE MANAGEMENT CONTRACTOR.	INDEFINITE, DEPENDING ON CHEMICAL IN QUESTION	SPECIALIZED INCINERATOR OR INERTIZE OR ENCAPSULATE or use suitable treatment in another country
MIXED WASTE Mixed Liquid Waste from Analyzers/Equipment containing a mixture of water, blood (infectious) and reagents (chemical) in varying proportions	→	CLEAR OR WHITE PLASTIC DRUM/BOTTLE APPROPRIATELY LABELED	DETERMINED BY VOLUMES GENERATED, STORAGE CAPACITY, AND APPROVED DISPOSAL METHOD	SEND SAMPLE TO SWAZILAND WATER SERVICES CORPORATION (SWSC) FOR TESTING AND DISPOSAL GUIDANCE OR CONSULT WITH SHLS NATIONAL SAFETY OFFICER

Annex F: Poster 3

SPILL MANAGEMENT Emergency Response Plan

- Only staff trained in **spill management** can conduct these procedures.
- Personal Protective Equipment (PPE) must be utilized as part of health and safety best practice.
- Refer to spill management Standard Operating Procedure (SOP) for detailed guidance.

- 1 Remain calm
- 2 Evacuate and quarantine the spill area
- 3 Assess the nature of the spill (see types in chart below)
- 4 Contact management and/or emergency services
- 5 Put on necessary PPE
- 6 Follow protocol for your type of spill
- 7 Work efficiently and carefully
- 8 Be aware of the surroundings at all times
- 9 Fill out internal incident form and submit to management

SPILL TYPES

INFECTIOUS WASTE	INFECTIOUS WASTE	INFECTIOUS WASTE	CHEMICAL
<p>Dry Spill</p> <ol style="list-style-type: none"> 1 Collect dry spill with brushes, pans or suitable equipment. 2 Place collected dry spill into a red bag. 3 Decontaminate spill area by carefully spraying with a sodium hypochlorite solution and wiping the area dry with cloths/paper towels. Repeat until all contaminants are visibly removed and the area is dry. 4 Place used cloths/paper towels into a red bag, close securely, and label correctly. 5 Take red bags to designated waste storage area. 6 Dispose of or decontaminate all PPE or equipment used. 	<p>Wet Spill (Blood & Body Fluids)</p> <ol style="list-style-type: none"> 1 Place cloths/paper towels or suitable absorbent on wet spill to absorb it (approximately 5 minutes). 2 Carefully collect saturated cloths/paper towels or absorbent material and place into a red bag. 3 Continue to carefully wipe the area with the cloths/paper towels until all visible contaminants are removed. 4 Place used cloths/paper towels into red bag. 5 Decontaminate spill area by carefully spraying with a sodium hypochlorite solution and wiping the area dry with a cloth/paper towel. Repeat until all contaminants are visibly removed and the area is dry. 6 Place used cloths/paper towels into the red bag, close securely, and label correctly. 7 Take red bags to designated waste storage area. 8 Dispose of or decontaminate all PPE or equipment used. 	<p>Sharps Spill</p> <ol style="list-style-type: none"> 1 Collect the sharps with a brush and long handled dust pan or other suitable equipment. NEVER PICK UP SHARPS WITH HANDS. Use forceps/tweezers where necessary. 2 Place collected sharps into a sharps container and close securely. 3 Decontaminate spill area by carefully spraying with a sodium hypochlorite solution and wiping the area dry with cloths/paper towels. Repeat until all contaminants are visibly removed and the area is dry. 4 Place used cloths/paper towels into a red bag, close securely, and label correctly. 5 Take the sharps container(s) and red bag to designated waste storage area. 6 Dispose of or decontaminate all PPE or equipment used. 	<p>General Spill</p> <ol style="list-style-type: none"> 1 Consult the Material Safety Data Sheet (MSDS) issued with the chemical in question for guidance. 2 Collect chemical spill with suitable equipment, as directed by the MSDS. 3 Place contaminated materials into a green bag or container (where applicable), close securely, and label correctly, as per MSDS. 4 Once spill is cleared, decontaminate spill area, as per MSDS. 5 Take green bag/container to designated waste storage area. 6 Dispose of or decontaminate all PPE or equipment used.
<p>HEAVY METAL</p>			
<p>Mercury Spill</p> <ol style="list-style-type: none"> 1 Retrieve the Mercury Spill Kit. 2 Place any broken glass (i.e. broken thermometers or glass sphygmomanometer columns) into a heavy-duty self-sealing plastic bag. The bag must be clearly marked to indicate that the contents are contaminated with mercury. 3 Collect all visible drops of mercury using one of the following: <ol style="list-style-type: none"> a. Aspirator with a narrow tube b. Syringe (without a needle) c. Pasteur pipette and a rubber bulb d. Strips of adhesive tape 4 Place collected mercury in glass or hard plastic jar with enough water to cover the mercury, close the lid securely, and label correctly. 5 Use cardboard sheets or masking tape to capture any spilled beads, using your torch for optimal visibility. 6 Place disposable gloves and all cleaning aids used in the cleanup process into a self-sealing bag and label accordingly. 7 Make arrangements with responsible person with regards to storage and/or disposal procedures for mercury waste. 8 Wash protective visors with liquid soap and warm water, and dry with paper towel before returning to Mercury Spill Kit. 9 Wash hands thoroughly with soap and warm water. 10 Document details in the logbook/control sheet found in the Mercury Spill Kit. 11 Return the Mercury Spill Kit to the person. Replace any used items in the Spill Kit. 			

WHO TO CALL
Once the emergency has been identified contact the appropriate departments

Operations Management (Internal)

NAME AND NUMBER _____

Health & Safety or Infection Prevention Control (Internal)

NAME AND NUMBER _____

Emergency Services (External)

NAME AND NUMBER _____

SEEK IMMEDIATE MEDICAL ATTENTION IF EXPOSED TO HAZARDOUS SUBSTANCES

References

- Kingdom of Swaziland, Ministry of Health. National Health Care Waste Management Guidelines, August 2012.
- Waste Regulations 2000 - Swaziland
- Occupational Safety & Health Act, 2001 – Swaziland
- Environment Management Act, 2002 - Swaziland
- SANS 10248: South African National Standard on The Management of Health Care Waste from Health Care Facilities.
- Chemicals: Merck chemical company.
- Chemicals: Chemical Safety Office, Risk Management Department, University of Vermont.
- Chemicals: Hazards in the Chemical Laboratory, 4th. Edition. 1986. Bretherick.
- DHHS, NIH, ORF and ORS: NIH Waste Disposal Guide Version 1
- <http://orf.od.nih.gov/EnvironmentalProtection/Documents/Waste20Calendar2004270920508.pdf>