Biological Risk Management and Containment

High Hazard Microbiological Spills

Cleaning and Decontamination

Containment Laboratory Guidelines

Version 2- February 2021

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Version: 2
Issue Date: 16 Feb 2021

This document was originally Version 1 which was extensively reviewed and approved in February 2021.

Record of Amendments to Version 2

Date	Page number	Nature of amendment

Contents

1. Who are these guidelines for?

These guidelines are intended for **principal investigators (PIs), designated persons in charge, designated laboratory person (DLPs),** technical staff and students trained in the safe use of **risk biologicals** in appropriate containment facilities.

Note that these guidelines apply to high hazard infectious micro-organisms used in PC2 laboratories. Separate PC3 laboratory spill procedures are available and these take precedence in the PC3 laboratory.

2. Spills inside biological safety cabinets (BSCs)

2.1 General

Spills inside a biological safety cabinet are generally considered to be a lower hazard than those outside the cabinet, as aerosols are contained by the cabinet air stream and HEPA filters.

This procedure applies to spills that occur inside all types of biological safety cabinets, irrespective of the level or type of containment facility.

2.1.1 Small Spills

Small spills, i.e. droplet-size spills or those up to 1mL, may be treated easily by wiping with decontamination agent-soaked absorbent material or flooding with an approved decontamination solution. Allow adequate contact time for the decontamination to take effect (refer to *Benchtop Decontamination* guidelines).

2.1.2 Larger Spills

The suggested procedure for a larger spill or breakage is as follows:

1) Ensure that the cabinet remains operating in order to retain aerosols during steps (2), (3), (4) and (5).
2) Place absorbent material wetted with an approved disinfectant (refer to *Benchtop Decontamination* guidelines). Allow 5-10 minutes contact time as specified in the *Benchtop Decontamination* guidelines.

3) Ensure a small waste receptacle is placed inside the cabinet.
4) Disinfect gloved hands and remove protective gloves in the cabinet, placing the used gloves in the waste receptacle.
5) Remove any contaminated clothing for decontamination and wash hands. Replace with clean gloves and protective clothing for carrying out the remainder of the clean-up.
6) After initial disinfection of the spill, remove any sharp objects with forceps and discard as contaminated sharps. Next, remove excess fluid with absorbent material and discard into a container for decontamination. Discard culture bottles, petri dishes and solid material associated with the spill into the same container. Decontaminate cultures, media and disposable materials adjacent to the spill.
7) Wipe down the cabinet floor, cabinet work zone and remaining items of equipment with fresh disinfectant solution. For Class II cabinets, disinfect both sides of the front grille and work floor within the cabinet.
8) Check that the spillage has not contaminated the sump. If the sump is contaminated, add sufficient decontamination solution to completely cover the sump floor. If the spill is large, use sufficient decontamination solution to dilute and inactivate the infectious material.
9) Consider whether the cabinet should be decontaminated before further use.
10) Complete an incident report, using the University's online accident/incident reporting system (Damstra).

3. Spills outside biological safety cabinets

Any spill of a large volume of high risk (as determined by the risk assessment) infectious material, with the generation of aerosols outside a BSC *will require evacuation of the area and clean-up directed by the floor manager/TTL*. The team is to wear protective clothing and PPE if the spill is hazardous to humans by the respiratory route.

When liquid is spilled, it is generally dispersed as three spill fractions:

1) The bulk of the liquid that remains in an irregular puddle
2) The portion that separates as splashes and rivulets
3) The small portion that is separated as airborne particles

The larger airborne particles settle rapidly, whereas the smaller particles can remain suspended in air for a considerable time and can be transported from the spill site by a ventilation system. In the event of a spill of liquid, it shall be assumed that an aerosol has been generated.

Once a spill of this type has occurred, evacuate the area immediately and allow sufficient time (at least 30 minutes) for aerosol particles to disperse before contaminated surfaces are disinfected**.**

NOTE: Although in certain circumstances respirators with P2 filters can provide adequate respiratory protection, the higher protection offered by HEPA filters with a full-face respirator is recommended for spill clean-up operations. Wear goggles if you are not using a full-face respirator.

The suggested response for a lab user is as follows:

1) If safe to do so, contain the source of the spill.
2) Move away from the spill.
3) Remove the laboratory gown and any other garment suspected of being contaminated, and place in a biohazard bag for subsequent decontamination. If you suspect that shoes are contaminated, remove and place in a separate biohazard bag.
4) Warn others to keep out of the area of the spill.
5) If contamination of the lab user is superficial, wash exposed skin and put on a clean laboratory gown. Use an eye wash station if the eyes or face have been exposed.
6) Leave the area and place a biohazard sign with DO NOT ENTER on the door.
7) Notify the designated person in charge that a spill has occurred.
8) If spilled material has soaked through your clothing, take a complete body shower in a regular (i.e. not an emergency) shower if possible.

The response for the spills clean-up team should be as follows:

1) Stay out of the spill area for at least 30 minutes. (Consider isolation of the recirculating ventilation systems).

2) Assemble a clean-up team consisting of three people: one to observe and direct the clean-up procedure, and the other two to carry out the procedure. Check all necessary equipment is available.
3) Before entering the area of the spill, put on appropriate protective clothing and equipment, such as gowns, gloves, boots, eye and respiratory protection.
4) Determine the extent of contamination.
5) Place absorbent material, such as paper towels, wetted with approved decontamination agent, over the spill. Allow adequate contact time for the decontamination to take effect (refer to *Benchtop Decontamination* guidelines).
6) Carefully remove any sharp objects with forceps and dispose of as contaminated sharps.
7) Clean up the spill and decontaminating solution. Starting from the outside, wipe towards the centre of the spill.
8) Transfer all contaminated materials for disposal.
9) Use the same disinfectant solution to wipe over surrounding areas likely to have been contaminated with aerosols. Allow adequate contact time for the decontamination to take effect (refer to *Benchtop Decontamination* guidelines), then discard waste for decontamination.
10) Ensure that each member of the clean-up team decontaminates PPE used to clean up the spill.
11) Complete an incident report using the University's online accident/incident reporting system (Damstra).

4. Definitions

High hazard infectious micro-organisms mean micro-organisms of Risk Group 2 *that have a route of infection via respiratory tract*. The University of Auckland Biological Safety Committee will give special consideration to spills outside a BSC when approving work with such micro-organisms, so that spill clean-up procedures can be proactively identified.

Risk biologicals are New Organisms, Unwanted Organisms, genetically modified organisms (GMOs), biological materials that present a potential biosecurity risk and micro-organisms with a risk classification of Risk Group 2 or higher, as defined by the United States National Institute of Health "Guidelines for Research Involving Recombinant DNA Molecules".

Designated laboratory person (DLP) means the trained person in each research group who has been given the authority to receive purchase requests made in SQERM and to make a formal request for a purchase order via PeopleSoft. In containment and transitional facilities DLPs will have additional training to enable them to scrutinise documentation for restricted items and provide support to researchers.

Designated person in charge means a staff member in any of the following roles: sector manager, facility manager, floor manager, technical manager or an appointed delegate.

Principal Investigator (PI): In the context of hazard containment and transitional facilities, a principal investigator is the holder of an independent grant administered by the University and the lead researcher for the grant project, usually in the sciences, such as a laboratory study or a clinical trial. The phrase is also often used as a synonym for "head of the laboratory" or "research group leader." The PI is responsible for assuring compliance with applicable University standards and procedures, and for the oversight of the research study and the informed consent process. Although the PI may delegate tasks, they retain responsibility for the conduct of the study.