Biological Risk Management and Containment

Microbiological Spills
(excluding high hazard spills)

Cleaning and Decontamination

Containment Laboratory Guidelines

Version 2- February 2021

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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 **low hazard infectious micro-organisms** (see definition below). There are separate guidelines for spills involving high hazard infectious micro-organisms (see "High Hazard Microbiological Spills").

Separate PC3 spill procedures are also available and these take precedence in the PC3 laboratory.

2. How should microbiological spills be treated?

2.1. Spills inside biological safety cabinets (BSCs)

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 (please refer to the instructions in the guidelines *Benchtop Decontamination*).

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 adequate contact time as specified in the *Benchtop Decontamination* guidelines.
3) Disinfect gloved hands and remove protective gloves in the cabinet. Remove any contaminated clothing for decontamination and wash hands and arms. Replace with clean gloves and protective clothing for carrying out the remainder of the clean-up.
4) 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.
5) 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.
6) Check that the spillage has not contaminated the sump. If the sump is contaminated, add sufficient approved decontamination agent solution to completely cover the sump floor. If the spill is large, use sufficient approved decontamination solution to dilute and inactivate the infectious material.
7) Consider whether the cabinet should be decontaminated before further use.
8) Complete an incident report, using the University's online accident/incident reporting system (Damstra).

2.2. Spills outside biological safety cabinets (BSCs)

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, you should assume that an aerosol has been generated.
For spills of infectious material, contain the contamination in the affected area. Spills in confined areas, especially cold rooms, require special considerations, e.g. the air-conditioning and air flow direction.

Treat general spills, such as from liquid cultures or culture plates, with an approved decontamination agent.

The process is:

1) 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.
2) Put on appropriate protective clothing such as gloves, gowns and eye protection.
3) Place absorbent material wetted with an approved decontamination agent over the spill. Allow adequate contact time as specified in the *Benchtop Decontamination* guidelines. Remove any sharp objects with forceps and discard as contaminated sharps.
4) Use the same disinfectant solution to wipe over the area likely to have been contaminated, allowing relevant contact times for decontamination.
5) Carefully mop up the spill and disinfection solution, working from the outside inwards. Place used absorbent materials in a biohazard bag.
6) Transfer all contaminated materials for decontamination by pressure steam sterilisation.
7) Remove protective clothing and decontaminate hands.
8) Complete an accident/incident report, using the University's online reporting system (Damstra).

2.3. Disposal of contaminated waste following spill clean-up

- Use normal laboratory waste disposal procedures for spill clean-up material.
- Do not autoclave spill clean-up material containing bleach.
- Decontamination agents should not normally be autoclaved as they are corrosive and can damage the autoclave or produce toxic vapours.

2.4. Centrifuge spills

Where a spill or leak is detected within a centrifuge, the procedure will depend upon the risk group of the agent involved as well as the construction of the equipment. The clean-up process should be as follows:

a) For sealed rotors or buckets that can withstand high temperatures, autoclave intact at 121°C for a minimum of 15 minutes.
b) For rotors and buckets not able to withstand high temperatures: Where breakage or spillage is observed, allow 30 minutes for aerosols to settle. Place the rotor or bucket in an approved non-corrosive decontamination agent, allowing sufficient contact time as specified in the *Benchtop Decontamination* guidelines.
c) If the disinfectant is corrosive, wipe internal surfaces with water or detergent at the end of the contact time. The use of glass centrifuge tubes should be avoided. If a glass centrifuge tube has broken, remove larger pieces of broken glass to the sharps container with forceps and use material such as cotton wool moistened with disinfectant to pick up the smaller pieces.
d) Wipe internal surfaces of the centrifuge bowl with approved non-corrosive decontamination agent, allowing sufficient contact time as specified in the *Benchtop Decontamination* guidelines

3. Definitions

Low Hazard Infectious Micro-organisms means micro-organisms of Risk Group 1 and 2 that do not have an accepted route of infection via the respiratory tract.

High Hazard Infectious Micro-organisms means micro-organisms in Risk Group 2 that do have a route of infection via the respiratory tract. The University of Auckland Biological Safety Committee will give special consideration to spills outside biosafety cabinets before approving work with such micro-organisms, so that spill clean-up processes 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.