

Biological Spills in Laboratories

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Owner: Manager OHS

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Key Responsibilities

- 1 Local managers and supervisors must ensure that where hazardous biological spills can occur, staff and students are aware of the risks, are familiar with spill management procedures and have access to the appropriate equipment.

Introduction

- 2 Spilled blood and body fluids/substances and infective agents may be encountered in many situations in the laboratory. Spills involving Genetically modified organisms (GMO's) are to be dealt with by registered office of the gene technology regulator (OGTR) trained personnel according to procedures documented with project licence application. Management of these spills may require specialised procedures and is outside the scope of this document. All biohazard spills must be attended to immediately.
- 3 The basic principles of spills management are:
 - standard precautions apply, including use of personal protective equipment (PPE) as applicable
 - cleaning up and disinfection after work with human blood and other body fluids should be conscientiously performed;
 - generation of aerosols from spilled material should be avoided.
 - hot water will make blood stick to the surface it is on. For this reason, cold or warm water should always be used for the first contact with blood or blood stained articles.
 - after clean up dry area so that it is not slippery.
 - disinfectants must not be mixed with detergents as this can render them ineffective, use these agents separately.
 - disinfectants can be deactivated by reacting with organic material such as blood, so if there is a lot of infective material present you will need a lot of disinfectant or you will need to reduce the load of organic material present by first carefully wiping up and removing the bulk of the organic material then deactivate all contact areas with an appropriate disinfectant. Always try to contain the spill, don't spread it, wipe material towards the centre and take care to remove any sharp objects with forceps before attempting wipe up
 - spills involving genetically modified infectious agents (GMO's) must be decontaminated as per guidelines and procedures laid out in training and documentation supplied by area management to laboratory users.

- spills involving infectious agents may require special treatment in addition to these guidelines, in these cases area management will need to be consulted before the spill area is returned to general use.

Reporting the Incident.

- 4 Always report blood/body fluid or other biohazardous spills. Use [the Accident/Hazard Report form](#) .
- 5 If the spill involves a GMO it must also be reported as soon as possible to the Laboratory and Biosafety Committee in writing as well as the laboratory manager or supervisor. Clean up of spills involving GMOs must be documented on report forms supplied by local area management.
- 6 All major spills must be reported immediately to the laboratory manager or supervisor. A major spill is one in which:
 - a hazardous material contacts skin, eyes, etc.
 - a break in the skin occurs
 - the spill splashes over an area larger than 30 cm in diameter
 - the extent of the spill is undetermined, or
 - the spill involves an agent transmitted by aerosol
 - the spill involves genetically modified organisms (GMO's)

Protective Clothing

- 7 Workers involved in cleaning must wear protective clothing. The minimum requirement is disposable gloves. If a spillage covers a large area, goggles/face shield, a waterproof apron (or gown) and overshoes will also be needed to prevent contamination of clothing.

Cleaning

- 8 Procedures for managing blood and other infective agent spills are dependent on the nature and size of the spill, as well as the location. Management of spills involving GMO's is beyond the scope of this document and dealt with in OGTR risk management procedures developed for the specific project involved.
- 9 Liquid spills generally have three components:
 - the bulk liquid that puddles on the surface
 - small splashes of liquid that are distributed around the spill area
 - even smaller droplets that form airborne particles (aerosols)
- 10 Think about where these components may have landed and make sure you clean all potential areas of contamination
- 11 Spot Cleaning Blood and body fluids on non-skin contactable areas:
 - Wear disposable gloves
 - Wipe up spot immediately with a damp cloth, tissue or absorbent paper towel.
 - Then clean with warm (not hot) water and detergent
 - Discard contaminated materials (tissue, paper toweling) as biological waste
 - [Take off and dispose of gloves](#) with [biological waste](#)
 - Wash hands thoroughly with soap and water
- 12 Spot cleaning of bacterial or viral culture materials
 - Clean up as for body fluids but in addition flood the area with [freshly prepared Virkon®](#) and allow react for 10 minutes before wiping up with paper towel. (Virkon® solution may damage your skin, clothes and shoes, on contact, ensure that you don't come in direct contact with this material).

13 Small Spills (up to 10 ml)

- Collect cleaning materials and equipment ('Spills kit optional')
- Wear disposable cleaning gloves. Eyewear and plastic apron should be worn where there is a risk of splashing occurring
- Check for sharps if these are present remove first with forceps and discard into sharps biohazard waste. Wipe up spill immediately with absorbent material (for example, paper hand toweling). Place contaminated absorbent material into soft biohazard waste.
- Clean the area with warm water and detergent using disposable cleaning cloth or sponge
- disinfect area by wetting with freshly prepared Virkon® solution and allow to react for 10 minutes then wipe area dry
- [Take off gloves](#)
- Discard contaminated materials (absorbent toweling, cleaning cloths, disposable gloves and plastic apron) as soft [biological waste](#)
- Wash hands thoroughly with soap and water
- Reusable eyewear should be cleaned and disinfected before reuse

14 Large Spills (greater than 10 mls)

- Where possible, isolate spill area
- Where a spillage of potentially infectious material has occurred the area must be vacated for at least 30 minutes for aerosol particles to be dispersed.
- Confine and contain the spill.
- Collect cleaning materials and equipment ('Spills kit') check spill kit disinfectant is within use by date.
- Wear disposable cleaning gloves, eyewear, mask and plastic apron
- Cover the spill with paper towels or absorbent granules, depending on the size of the spill, to absorb the bulk of the blood or body fluid/substance. Use disposable (for example, cardboard) scraper and pan to scoop up absorbent, paper towel and any unabsorbed blood or body substances. Place all contaminated items into impervious container or plastic bag for disposal as either soft or sharps [biological waste](#).
- Disinfect area by flooding with freshly prepared Virkon® and allow 10 minutes to react then wipe up making sure that you don't allow it to come into contact with your skin or clothing and discard in biohazard waste.
- Decontaminated areas should then be cleaned thoroughly with warm water and neutral detergent.
- Wipe surroundings that may have been contaminated with aerosols using Virkon® solution.
- Discard contaminated materials (absorbent toweling, cleaning cloths, disposable gloves and plastic apron) as soft [biological waste](#)
- [Take off gloves](#)
- If the outside of the Biohazard bag becomes soiled then assistance will be needed. Someone will need to hold open a second clean bag while you place the soiled bag into it, followed by your gloves.
- Wash hands thoroughly with soap and water on completion
- Autoclave all items used to clean the area, including the protective clothing. Do not autoclave material containing hypochlorite, since chlorine gas can be produced.
- Clean and disinfect bucket and mop. Dry and store appropriately

15 Spills on carpet:

- For blood spills clean with a neutral detergent and arrange through Property Services Division for the carpet to be shampooed with an industrial carpet cleaner as soon as possible.
- For infectious cultures consult with laboratory manager or supervisor for appropriate disinfection solution.

16 Spills on Porous Surfaces

- If the site is porous or cannot be adequately cleaned prior to disinfection you will still need to disinfect the area using Virkon® solution. Virkon® can be added to carpet areas allowed to react for 10 minutes and then vacuumed up using a wet and dry vacuum cleaner. Check a small area of carpet first to check for staining action first.

Virkon® Reconstitution Instructions

- 17 Decide how much Virkon® will be needed to clean up the spill. Check the expiry date on the tablet container. Each Virkon tablet will make up 500ml of disinfectant when added to the appropriate volume of tap water. E.g. if 2 litres is required measure this volume out into a container and add 4 Virkon tablets. Virkon tablets will fizz when added to water, mix with a gentle swirling action and allow to completely dissolve. The tablets will produce a pink liquid which is generally stable for 7 days. The pink colour is an indicator that the disinfectant is working properly. If solution is not pink do not use it.
- 18 Just remember:
- Check tablets are within expiry date
 - Add 500 ml tap water per tablet
 - Ensure solution is pink
 - Label container with the date of reconstitution
 - Use within 7 days once made up
- 19 Commercial source of Virkon Tablets and powders is Halson Enterprises Pty Ltd, PO Box 205, Rosanna, 3084, phone: 9458 3390 (tablets come in packets of 20 and come with an expiry 1-2 years.)

Spills kits

- 20 In the biological laboratory and in medical settings standard cleaning equipment, including a mop and cleaning bucket plus cleaning agents, should be readily available for spills management and should be stored in an area known to all workers.
- 21 A supply of tablet or powder Virkon® should be available in the kit. Expiry date of the Virkon® needs to be recorded container. A scraper and pan should be used to remove the absorbed material.
- 22 All re-useable cleaning equipment should be thoroughly cleaned after use and stored dry.
- 23 For larger spills and spills in field situations, it may be advisable to have a spills kit prepared. This could be in the form of:
- large (10 litre) re-usable plastic container or bucket with fitted lid, containing materials such as:
 - two large (10 litre) impermeable sealable plastic waste disposal bags
 - disposable impermeable rubber gloves suitable for cleaning
 - a disposable, sturdy cardboard scraper and pan (similar to a 'pooper scooper')
 - Virkon® disinfectant either powder or tablet form with expiry date noted on the container
 - disposable rubber gloves that are suitable for cleaning
 - eye protection (disposable or reusable)
 - plastic apron
 - a mask (for protection against aerosols from high-risk spills that may be generated during the cleaning process)
 - pair of forceps for picking up contaminated materials if necessary

- 24 With all spills management protocols, it is essential that the affected area is left clean and dry. Disposable items in the spills kit should be replaced after each use of the kit.
- 25 The person in charge (Laboratory Manager) shall ensure that blood spill kits are available whenever blood or blood containing materials are handled.

Disinfectants

- 26 Some commonly used disinfectants and their properties are listed in Chapter 7 of [Infection control guidelines for the prevention of transmission of infectious diseases in the health care setting](#). Also the [Australian Standard 2243.3:2002](#), has good information in Appendix E about chemical disinfectants.
- 27 Virkon® is recommended in preference to hypochlorite solutions because of its ease of use and stability.
- 28 Hypochlorite solution is a very effective disinfectant however it is dangerous to use, corrosive and tends to bleach surfaces. It is difficult under normal working conditions to determine the concentration of active chlorine in stored solutions. (See for shelf life of 5% hypochlorite solution: <http://www.forp.usp.br/restauradora/soda/sodaingl.html>)
- 29 The effectiveness of disinfectants depends on appropriate concentration/dilution and contact time with organisms and the concentration of other proteins encountered in the particular situation. Always check manufacturers' labels and Material Safety Data Sheets for instructions before use.

Removal of Gloves.

- 30 The following procedure is recommended when removing gloves
 - Grasp the back of one glove and pull it forward thus turning the glove inside out. Scrunch up the removed glove in your remaining gloved hand.
 - Carefully insert the thumb of the ungloved hand under the cuff of the remaining glove ensuring that the clean hand does not come into contact with the outside contaminated surface of the glove.
 - Pull the glove forwards until it inverts itself over the other glove. Then grasping the clean interior of the glove complete removal and dispose of two inverted gloves into a Biohazard bag.

Disposal of Waste Material.

- 31 The biohazard waste must be disposed of according to the current EPA regulations pertaining to infectious medical waste. Contact the Laboratory Manager for contact details of biohazard waste contractors.

Standards

- Australian Standard 2243.3: Safety in Laboratories – Microbiology
- Victorian Government, Department of Human Services: [Blue book - Guidelines for the control of infectious diseases](#) Revised edition 2005

[Appendix 3: Standard and additional precautions](#)

[Appendix 5: Procedure for managing spills of blood and body fluids/substances](#)

[Appendix 6: Cleaning and waste disposal procedures](#)

- Victorian Government, Department of Human Services - [Procedure for dealing with spills of blood and body fluids](#)