



# **Risk Management of Hazardous Biological Materials**

## **Guidance: Control measures Incidental contact**

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## Introduction

This document can help you to complete the control measures section in an activity or COSHH risk assessment. Speak to the University Biological Safety Contacts for help in identifying the biological materials hazard groups you may come across, or if you have any other questions.

	Definition and examples	Control measures and suggested actions
<b>Hazard Group 1</b>	<p>These materials are unlikely to cause disease or harm to people, animals or the environment. Examples include green algae.</p>	<p><b>Required</b></p> <ul style="list-style-type: none"> <li>• Good personal hygiene procedures e.g. hand-washing.</li> </ul>
<b>Hazard Group 2</b>	<p>These materials can cause disease; and may be a hazard to people; the disease is unlikely to spread from you to the community and there is usually effective treatment available.</p> <p>It is also unlikely to be spread between animals or within the environment.</p> <p><b>Examples of diseases include:</b>  <i>Through wounds or skin punctures:</i> Tetanus  <i>Through hand-to-mouth contact / poor hygiene:</i> Salmonella, Toxoplasma, Norovirus (otherwise known as Winter vomiting bug),  <i>Through airborne aerosols:</i> Legionella;  <i>Through skin contact:</i> Ringworm;</p>	<p><b>Required</b></p> <ul style="list-style-type: none"> <li>• Good personal hygiene procedures e.g. hand-washing.</li> <li>• Not eating and drinking whilst carrying out the activity.</li> <li>• Health surveillance and vaccinations where appropriate e.g. tetanus.</li> </ul> <p><b>As identified</b></p> <ul style="list-style-type: none"> <li>• Appropriate Personal Protective Equipment (PPE), this may be gloves (e.g. nitrile, marigold, stab-proof) or other protective clothing (e.g. labcoat, coveralls or overalls) appropriate to the job.</li> <li>• Use of equipment to reduce potential exposure – separating the person from direct contact e.g. a spade to pick up soil.</li> <li>• Possible use of face mask to prevent inhalation.</li> <li>• Staff awareness of symptoms and what to do should they start experiencing them.</li> <li>• Cleaning of contaminated clothing - allowing for separation from everyday clothing, and supply by the University.</li> </ul>
<b>Hazard Group 3</b>	<p>These materials can cause severe disease and may be a serious hazard to employees; the disease may spread from you to the community, but there is usually effective treatment available.</p> <p>It may also spread to and between animals and within the environment.</p> <p><b>Examples of diseases include:</b>  <i>Through wounds or skin punctures:</i> Hepatitis C, Hepatitis B, HIV.  <i>Through hand to mouth contact / poor hygiene:</i> Anthrax  <i>Through airborne aerosols:</i> TB, Anthrax.</p>	<p><b>Please note – exposure to these is unlikely.</b></p> <p><b>Required</b></p> <ul style="list-style-type: none"> <li>• Good personal hygiene procedures e.g. hand-washing.</li> <li>• Not eating and drinking whilst carrying out the activity.</li> <li>• Health surveillance- vaccinations where appropriate e.g. tetanus, Hepatitis B.</li> <li>• Appropriate Personal Protective Equipment (PPE), this may be gloves (e.g. nitrile, marigold, stab-proof) or other protective clothing (e.g. labcoat, coveralls or overalls) appropriate to the job.</li> <li>• Possible use of face mask to prevent inhalation.</li> <li>• Use of equipment to reduce potential exposure – separating the person from direct contact e.g. a spade to pick up soil.</li> <li>• Staff awareness of symptoms and what to do should they start experiencing them.</li> <li>• Cleaning of contaminated clothing - allowing for separation from everyday clothing, and supply by the University.</li> </ul>

	Definition and examples	Control measures and suggested actions
<b>Hazard Group 4</b>	<p>These materials cause severe disease and are a serious hazard to employees; it is likely to spread to the community, and there is usually no effective treatment available.</p> <p>It is highly likely to spread to and between animals and within the environment.</p> <p><b>Examples of a disease include:</b>  <i>All routes (airborne, skin contact etc)</i>  Foot and Mouth.  <i>Through wounds or skin punctures, or hand to mouth contact:</i>  Ebola.</p>	<p><b>Please note – exposure to these is highly unlikely.</b></p> <p><b>Required</b></p> <ul style="list-style-type: none"> <li>• Speak to the University Biological Safety Contacts.</li> </ul>

### Assessing the risks

Find out how people might come into contact with hazardous biological material (i.e. infectious micro-organisms) at work. This may be as a result of contact with people or animals, or else your workplace itself may be a source of contamination. This includes any tools you use.

Find out if there are conditions that could allow infectious micro-organisms found in the natural environment to contaminate and grow, if you don't take steps to control them. For example legionella bacteria are equally at home in cooling towers or dead-legs of hot and cold water services as they are in the natural aquatic environment.

Identify which sources of infection are present. When you have identified the source(s) of infection, consider how likely it is that infection will result - think about:

- how often the task is carried out;
- how many staff are exposed; and
- how much infectious material is handled.

If you determine that there is a significant risk, then decide whether existing controls are sufficient or do you need to do more? For hazardous biological materials you should consider:

### What are the health risks?

- Can it cause harm (e.g. disease, allergy etc), and how severe can that harm (disease) be?
- What available treatments, vaccines or medicines are there?

### How do micro-organisms enter the body?

- There are a number of routes for incidental contact with hazardous biological materials:
  - Inhaling them - e.g. breathing in fungal spores from mouldy hay may lead to 'farmers' lung'.
  - Ingesting them - e.g. eating lunch with unwashed hands may lead to gastroenteritis from salmonella.
  - Through the skin - e.g. cutting a finger on a sharp object whilst collecting environmental samples may leave someone at risk from tetanus; a needlestick in a lab whilst handling human tissue may lead to the risk of exposure to hepatitis or HIV/ AIDS.

### How do I protect workers from risks to health?

- Controlling the risk of infection is relatively straightforward – usually, simple good personal hygiene measures, such as washing hands or wearing gloves, are sufficient.

## General Principles of Good Practice, Good Microbiological Practice (GMP) and Good Occupational Safety and Hygiene (GOSH)

- 1) Keep workplace and environmental exposure to any biological agent to the lowest reasonably practicable level (*it is also good practice to reduce aerosol and dust generation as part of basic hygiene precautions.*)**

The key to this is the use of good practice to achieve a low level of exposure. Standard good practice, such as that set out in the [SACGM Compendium of Guidance](#) will normally constitute accepted levels of lowest reasonable practicability.

- 2) Exercise engineering control measures at source and supplement these with appropriate personal protective clothing and equipment where necessary.**

This follows the hierarchy of control measures which requires that if exposure cannot be prevented (by elimination or substitution) exposure is controlled through primary containment in the first instance. Protective clothing is always required, although in some cases this is work clothing rather than specialist laboratory coats or overalls. This is actually a slightly different emphasis to the normal control hierarchy for non-biological material. Microbiological safety cabinets (i.e. engineering control) may not always be required - even though protective clothing is.

- 3) Carry out routine tests and maintenance controls on protective equipment.**

It is important to ensure the integrity of containment and that other control measures are being applied. The frequency and degree of testing/examination of equipment and control measures will be dependent on the level of risk and nature of the activity.

- 4) Test, where necessary, for the presence of viable process organisms outside the primary physical containment.**

Where the risk assessment shows that monitoring for viable organisms outside the primary containment (e.g. culture vessel) is necessary to ensure effective control, this must be undertaken. Monitoring could include both monitoring within the workplace and also in the surrounding environment. In particular, monitoring of waste, especially at the point of disposal, is likely to be necessary when there is any possibility that harm might result from any escape;

- 5) Provide appropriate training of personnel and to keep suitable records of the training.**

The level of training should be appropriate to the level of risk and the complexity of the operations being undertaken.

- 6) Formulate and implement local codes of practice for the safety of personnel, as required. (In particular local rules should minimise the use of sharp instruments and ensure correct use and disposal. Local codes should also outline procedures designed to protect the environment.)**

The content and form of local codes of practice will be dependent on the level of risk and nature of activities being undertaken. They might include: operating instructions for particular equipment; management issues; systems of work; maintenance regimes.

- 7) Provide washing and decontamination facilities for personnel.**

What constitutes appropriate facilities would be dependent on the risk and nature of the work.

- 8) Keep adequate records.**

Keep records of risk assessment, you should also keep records of work that has been undertaken and any modifications to the risk assessment or control measures.

- 9) prohibiting in the work area eating, drinking, smoking, applying cosmetics or the storing of food for human consumption;**

- 10) prohibiting mouth pipetting;**

- 11) Provide written standard operating procedures where appropriate to ensure safety.**

Appropriateness should be with regard to the level of risk and nature of the activity and equipment;

- 12) Have effective disinfectants and specified disinfection procedures available in case of spillage of biological agents.**

Disinfection should reduce the numbers of live organisms by at least 99.999% - ie a 5 log reduction.

- 13) Provide safe storage for contaminated equipment and materials where appropriate.**

Appropriateness must be decided based on the risk.

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