

Risk Management of Hazardous Biological Materials

Guidance: handling human materials





Introduction

This Guidance sets out the main areas to consider when you plan to undertake work with human materials in a laboratory setting. It is not for use in a clinical or healthcare setting. For more information or guidance speak to the [University Biological Safety Contacts](#).

Please note this guidance does not address any ethical considerations for the handling of human material – this should be directed to your local or [University Ethics Committee](#) before work starts.

Key definitions

What are **human materials** – these are any samples obtained from a human; including blood, urine, tissue, faeces, saliva, cerebral spinal fluid, synovial fluid, foetal tissue, amniotic fluid, placenta etc.

What do we mean by **Screened Samples** – are those obtained through the Blood Transfusion Service or from a tissue bank that undertakes screening of their samples for harmful pathogens. Where these samples are proved to be negative for harmful pathogens, the material can be handled at Containment Level 1. When samples are screened and are shown to contain a pathogen, they should be handled at the appropriate Containment Level for that pathogen.

What do we mean by **Unscreened Samples** – human materials that do not come from a screened source must be regarded as potentially infectious (e.g. harbour Blood Borne Viruses (BBV's) such as HIV and Hepatitis B). They must therefore be handled at Containment Level 2 with the additional precautions highlighted in the tables below. If the materials come from a high risk population (e.g. intravenous drug users, or from Sub-Saharan Africa) where the potential for preference of pathogens is higher, the Containment Level should be increased accordingly.

If a sample is shown or discovered to be infected at a later date, then the risk assessment should be revisited and the Containment Level altered accordingly ([or the sample correctly disposed of](#)).

What are **Sharps** – these are blunt and sharp needles, scalpel blades, glass pasteur pipettes (short and long form), broken contaminated glassware, glass drug/chemical vials, surgical instruments and glass slides or any other item that may cause cuts or puncture wounds.

Risk assessment: key points

- Work with human material may fall into either [incidental contact or deliberate work](#) [
- However, most work with human materials falls under **deliberate** work – for examples collecting tissue samples for primary culture, culturing lymphocytes from blood; extracting DNA / RNA from any human material. You should then follow the [deliberate work process](#).
- There are some exceptions to this when contact is incidental and should be included in the activity risk assessment; this may include collection of a blood sample for biochemical testing e.g. measuring the level of glucose; or collecting a urine sample for measurement of electrolytes.
- If you are unsure speak to the University Biological Safety Contacts

Additional control measures and precautions when using human materials

In addition to the general control measures in the table below, you should put additional controls and precautions in place when handling human material:

- Sharps should **only** be used when there is no alternative and this is justified within the risk assessment.
- Any sharps must be disposed of into a UN7320:1990 compliant sharps bin and disposed of via the Healthcare waste route
- All waste must be disposed of via the Healthcare waste route
- Gloves must be worn at all times and removed and disposed of before leaving the laboratory.
- In the event of damage or contamination to the gloves, these must be removed, hands thoroughly washed and new gloves put on before continuing work.
- On completion of work the whole work space and any equipment should be disinfected.

Title:	Bio Materials Guidance: handling human materials	Number:	PRSG8.14	Issue date:	July 11	Page Number	Page 2 of 4
---------------	--	----------------	----------	--------------------	---------	--------------------	-------------



- Samples to be centrifuged must be in sealed buckets or rotors. When there is risk of aerosol creation or a known broken sample, then buckets and rotors must be opened in a microbiological safety cabinet.
- Further PPE such as aprons and eye protection should be worn when work may create splashing.
- When there is risk of aerosol creation then a microbiological safety cabinet must be used.

Health Surveillance

- Unscreened human materials should be worked with as if they were at least hazard group 2.
- This means that individuals working with unscreened human materials must be registered with the Occupational Health Service.

Containment levels for laboratory work with human materials			
	Yes / No	Minimum Containment Level	Control Measures and Suggested Actions
Is the sample from the Blood Transfusion Service or tested to be negative for any pathogen, Hepatitis &/or HIV? i.e. a screened sample	Yes	Use Containment Level 1	Required <ul style="list-style-type: none"> • Good Occupational Safety and Hygiene procedures e.g. washing hands. • Good Laboratory Practice e.g. no eating and drinking whilst carrying out the activity.
	No	Consider as containing Hazard Group 2 and use Containment Level 2 and additional precautions if required by risk assessment	Required <ul style="list-style-type: none"> • Good Occupational Safety and Hygiene procedures e.g. washing hands. • Good Laboratory Practice e.g. no eating and drinking whilst carrying out the activity. • Health surveillance and vaccinations where appropriate e.g. tetanus. As identified <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE), this may be gloves (e.g. nitrile, marigold, stab proof) or other protective clothing appropriate to the job, - clothing provided for work purposes e.g. someone in catering wearing chefs whites or a plumber wearing a work uniform (coveralls or overalls). • Use of equipment to reduce potential exposure – separating the person from direct contact e.g. pickers for collecting waste, a spade to pick up faeces. • Possible use of face mask to prevent inhalation. • Staff awareness of symptoms and what to do should they start experiencing them. • Cleaning of contaminated equipment or clothing - allowing for separation from everyday clothing, and supplied by the University.
If the samples are from the Blood Transfusion Service or tested to be negative for any pathogen, Hepatitis &/or HIV are they to be grown in tissue culture for more than 100 hours?	Yes	Consider as containing Hazard Group 2 and use Containment Level 2 and additional precautions if required by risk assessment	As Hazard Group 2: Required <ul style="list-style-type: none"> • Good Occupational Safety and Hygiene procedures e.g. washing hands. • Good Laboratory Practice e.g. no eating and drinking whilst carrying out the activity. • Health surveillance and vaccinations where appropriate e.g. tetanus. As identified <ul style="list-style-type: none"> • Appropriate Personal Protective Equipment (PPE), this may be gloves (e.g. nitrile, marigold, stab proof) or other protective clothing appropriate to the job, - clothing provided for work purposes e.g. someone in catering wearing chefs whites or a plumber wearing a work uniform (coveralls or overalls). • Use of equipment to reduce potential exposure – separating the person from direct contact e.g. pickers for collecting waste, a spade to pick up faeces. • Possible use of face mask to prevent inhalation. • Staff awareness of symptoms and what to do should they start experiencing them. • Cleaning of contaminated equipment or clothing - allowing for separation from everyday clothing, and supplied by the University.
Is the sample from a patient suspected or	No	Use Containment Level 2 and additional precautions if required by risk	As Hazard Group 2: Required <ul style="list-style-type: none"> • Good Occupational Safety and Hygiene procedures e.g. washing hands. • Good Laboratory Practice e.g. no eating and drinking whilst carrying out



tested to be positive for any pathogen, Hepatitis &/or HIV? i.e. an unscreened sample.		assessment	<p>the activity.</p> <ul style="list-style-type: none"> Occupational Health Surveillance and vaccinations where appropriate e.g. tetanus. <p>As identified</p> <ul style="list-style-type: none"> Appropriate Personal Protective Equipment (PPE), this may be gloves (e.g. nitrile, marigold, stab proof) or other protective clothing appropriate to the job, - clothing provided for work purposes e.g. someone in catering wearing chefs whites or a plumber wearing a work uniform (coveralls or overalls). Use of equipment to reduce potential exposure – separating the person from direct contact e.g. pickers for collecting waste, a spade to pick up faeces. Possible use of face mask to prevent inhalation. Staff awareness of symptoms and what to do should they start experiencing them. Cleaning of contaminated equipment or clothing - allowing for separation from everyday clothing, and supplied by the University.
	Yes	Handle at appropriate Containment Level corresponding to hazard group of pathogen, with additional control measures if required by risk assessment*	Use precautions identified in line with hazard group of organism
If the samples are suspected or tested to be positive samples are they to be grown in tissue culture for more than 100 hours?	Yes	Handle at appropriate Containment Level corresponding to hazard group of pathogen, with additional control measures if required by risk assessment*	Use precautions identified in line with hazard group of organism
	No	Use Containment Level 3*	<p>As Hazard Group 3: Required</p> <ul style="list-style-type: none"> Good Occupational Safety and Hygiene procedures e.g. washing hands. Good Laboratory Practice e.g. no eating and drinking whilst carrying out the activity. Health surveillance- vaccinations where appropriate e.g. tetanus, Hepatitis. Appropriate PPE, this may be gloves (e.g. nitrile, marigold, stab proof) or other protective clothing appropriate to the job,- clothing provided for work purposes e.g. someone in catering wearing chefs whites or a plumber wearing a work uniform (coveralls or overalls). Possible use of face mask to prevent inhalation. Use of equipment to reduce potential exposure – separating the person from direct contact e.g. pickers for collecting waste, a spade to pick up faeces. Staff awareness of symptoms and what to do should they start experiencing them. Cleaning of contaminated equipment or clothing - allowing for separation from everyday clothing, and supplied by the University.

Adapted with permission from the Medical Research Council.

*Detailed risk assessment may exceptionally justify undertaking the work at a lower level of containment to that described here. Derogation of containment in this way is subject to consultation with the Biological Safety Coordinator or [University Biological Safety Contacts](#) and approval by the Biological Safety Committee. Help and advice on risk assessment can be given on a case by case basis and researchers are encouraged to do this at an early stage in the planning.