James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research

# STANDARD OPERATING PROCEDURE

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| **Title:** | **Biohazardous Material Handling** | | |
| **Procedure:** | BB.001.01 | **Supercedes:** | none |
| **Originator and Date:** | Lise Matzke<br>21OCT2008 | **Effective Date:** | 21OCT2008 |
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## Purpose

This procedure covers the safe handling of Biosafety Level 2 materials such as unfixed human tissue, blood and body fluids. This document's purpose is to ensure that the Biobank personnel are not unsafely exposed to the biological hazards associated with handling unfixed human tissue, blood and body fluids.

This document is to provide safe practices for meeting the University of British Columbia's and Health Canada's Laboratory Biosafety Guidelines. The scope of this document is designed to:

- Ensure that Biobank personnel are not unsafely exposed to the biological hazards associated with handling unfixed human tissue, blood and body fluids.
- Provide safe practices for meeting the University of British Columbia's and Health Canada's Laboratory Biosafety Guidelines.

## Responsibilities

This procedure is applicable to the following personnel:

- Biobank personnel

Others who may be responsible for handling biospecimens

## Safety

- All unfixed human biospecimens must be treated as biohazardous and potentially infectious.
- All injuries, such as cuts, that occur while working with biohazardous materials must be reported to the Laboratory Manager, Supervisor and Safety Officer.
- Lab coats and gloves must be worn. Nitrile gloves are recommended because they have far fewer pinholes in them compared to latex gloves. Gloves must be removed when touching non-contaminated items such as phones, door handles, faucets, etc.
- Glasses, goggles or face shields must be worn when necessary to protect the eyes and face from splashes or impacting objects.
- Protective lab clothing should not be worn in non-lab areas. Lab coat hooks should be available near the exits. Lab coats or gowns should not be stored in the same location as street clothing.
- Appropriate closed toe and heel shoes and full length pants must be worn.
- Eating, drinking and chewing gum are not permitted in the lab.
- All vacutainers should be transported in a sealed, leak proof plastic container/bag to contain spills if dropped. The container should also be marked with a biohazard symbol.
- Lab doors must be labeled with a biohazard sign stating containment level 2 and two emergency contact phone numbers.
- All equipment and work areas used for processing biohazardous materials must be clearly marked and have restricted access.
- Biological safety cabinets can be vented into a lab if the exhaust is first HEPA-filtered, except if using radioactive and/or carcinogenic materials.
- Hand washing is necessary after removing gloves, before leaving the lab and at any time after handling materials known or suspected to be contaminated.
- Work surfaces must be cleaned and decontaminated at the end of the day and after any spill of potentially dangerous material.
- An emergency plan for handling spills of infectious material must be developed and be ready for use whenever needed. Lab workers must be educated and drilled in the emergency plan.
- Vacuum lines used for work involving biohazardous materials must be protected from contamination by HEPA filters or equivalent. They must be checked routinely and replaced when necessary. Appropriate systems such as a hydrophobic filter or an overflow reservoir must be in place to insure that backflow into the vacuum line can not occur.
- Service personnel and cleaning staff that enter the lab must be informed of the hazards that might be encountered. Cleaning staff should only clean the floors. At SPH, trained cleaning staff are involved in removal of biohazardous waste bags/containers.

## Definitions

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| Biobank identification number | Unique identifier that links a specific piece of data or sample to a patient in an un-identified form. |
| Biohazardous materials | Human tissue, cells, body fluids, or culture materials that may contain infectious or other hazardous materials. |
| Biosafety Level 2 | Work involving agents of moderate potential hazard to personnel and the environment and has several specific advisements: (1) laboratory personnel have specific training in handling pathogenic agents and are directed by competent scientists; (2) access to the laboratory is limited when work is being conducted; (3) extreme precautions are taken with contaminated sharp items; and (4) certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment. |
| Biospecimen | All biological material of human origin, including organs, tissues, bodily fluids, teeth, hair and nails, and substances extracted from such material such as DNA and RNA. |
| Dry Data | Data as it exists on paper or in a database. This may include patient data. |
| Other Materials | Any other product/tangible material that is not covered under the definition of biospecimen or dry data. |
| PPE | Personal Protective Equipment. The equipment and clothing required to mitigate the risk of injury from or exposure to hazardous conditions encountered during the performance of duty. PPE includes, but is not limited to: face shields, lab coat, goggles and gloves. |
| SOP | Standard Operating Procedure. Document used to control the methods and requirements by which personnel will perform their activities. |

## Materials and Equipment

The materials, equipment and forms listed in the following list are recommendations only and may be substituted by alternative/equivalent products more suitable for the site procedure.

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| Garbage bags (yellow and red – note distinction for use of each) | HEPA filter for vacuum line |
| Biohazardous sharps container made of puncture-proof materials (Yellow containers) | Hydrophobic filter for vacuum aspirators |
| Bleach or alternate commercial disinfectant | Lab coats |
| 70% ethanol | Glasses |
| Nitrile gloves | Goggles or face shields |
| Aerosol containment vessels for centrifuging biospecimens | Bench paper, absorbent pads |
| Signage for biohazards | Hand soap |
| Scalpel blade removers (Feather) | Red Bags/Buckets |
| A BSC/fume hood | Virox 5(RTU) Surface Cleaner and Disinfectant |
| Plastic bags | Presept Disinfectant Tablets |

## Procedures

1) **Handling Conditions**
    a. Unfixed human tissue, blood and body fluids can be worked with on an open bench for procedures which do not have the potential to generate aerosols.
    b. Countertops should be covered with bench paper to reduce the aerosols produced by spills. When a spill occurs the bench paper should be changed immediately.
    c. The lab must be kept neat, orderly and clean. Storage of materials not pertinent to the work should be minimized.
    d. Gloves should be changed when they become visibly contaminated.
    e. All contaminated equipment must be decontaminated before being washed and stored or discarded.

2) **Decontamination procedures**
    a. Autoclaving is the best method. Many items can't be autoclaved and therefore decontamination solutions must be used.
    b. Most commonly used is 10% bleach, made fresh daily. Alternatively a commercial disinfectant (i.e. Conflikt, Phenokil) can be used. The solution you use will depend on the surface you are decontaminating. Contact

should be at least 20 min. Refer to product instructions for proper dilution necessary.

c. Never spray or pour the decontamination solution directly on a spill as this will create aerosols. Use a cloth to spread the decontamination solution over the spill. Once the spill has been wiped up the area should be wiped down again with fresh decontamination solution. This step should be repeated three more times.
d. A biological safety cabinet/fume hood should be used whenever there is a potential for aerosol production. Some common procedures requiring aerosol containment are:
    i) Uncapping vacutainers
    ii) Centrifugation: tightly sealed tubes must first be placed in an aerosol proof safety container before being placed in the centrifuge. After centrifugation a biological safety cabinet/fume hood must be used to open the aerosol proof safety containers as well as uncapping of the tubes that were centrifuged.
    iii) Vortexing
    iv) Opening the aerosol proof rotor when preparing cytospins of unfixed biospecimens
e. Remove scalpel blades from handles using the blue scalpel blade removal boxes.

**3) Waste disposal**

a. **Sharp waste**. All sharps used with biohazardous materials must be disposed of in a yellow biohazardous sharps container. They are clearly marked as biohazardous sharps and are made of puncture resistant plastic. Sharps are objects capable of puncturing the skin. These include: glass vacutainers, needles, scalpels, knives, razors, scissors, and broken glass. The yellow biohazardous sharps containers should only be filled up to the "FULL LINE" indicator. Full containers are sealed and taped over with masking tape then placed by the glass disposal area for discard by trained cleaning staff.
b. **Non-sharp waste.** All biohazardous non-sharp waste must be placed in a yellow garbage bag. These yellow bags are changed on a regular basis by trained cleaning staff. A supply of yellow bags is kept in (insert location). Examples of non-sharp biohazardous waste are plastic lab ware and towels used to clean-up spills or for decontamination.
c. **Blood and body fluids.** Dilute with full strength bleach to give a 10% solution of bleach. Leave for at least 20 min before discarding down the drain. Blood and body fluids can also be placed in an autoclave safe container and then autoclaved.
d. **Tissue.** Small pieces of unfixed tissue should be fixed in 10% formalin (minimum of 24 hours) prior to placing in a yellow bag. Larger, identifiable

pieces of tissue should be fixed in formalin before being placed in a red colored bag for disposal in a red colored bucket.

e. **Unfixed anatomical waste.** This waste has to be disposed of in special red bags and containers.
f. **Plastic tube waste.** Excess tubes are to be disposed of per site regulations.

## 4) Reference Material

a. Health Canada's Laboratory Biosafety Guidelines, 3rd Edition 2004
b. UBC Dept of OS&E Laboratory Biosafety Reference Manual, 4th Edition 2001
c. Laboratory Biosafety Manual, World Health Organization, Geneva 1993
d. Centres for Disease Control and Prevention (http://www.cdc.gov/)