Biological Spill Response Procedures

Laboratories that are handling infectious agents must develop spill response plans addressing foreseeable occurrences.

A Biological Spill Kit with items to clean and/or contain a biological spill must be placed in a designated location inside the lab, all personnel must know of the location. At a minimum, the spill kit should contain:

- Gloves (appropriately sized and within expiration date).
- Eye protection.
- Lab coat (clothing protection).
- Paper towels or other appropriate absorbent.
- Fresh 10% bleach solution or other approved sterilization product.
- 'Biohazard' bags.
- Sharps container.
- Forceps, tongs, broom and dust pan.

Personal exposure takes priority over clean up. If you are exposed, immediately remove contaminated clothing and other protective equipment and wash affected areas with soap and water. Medical follow-up should be sought in case of exposure.

Biosafety Risk Groups:

Biosafety Level 1 (BSL 1):

Organisms are well-characterized agents not known to cause disease in healthy adult humans and are of minimal potential hazard to laboratory personnel or to the environment. Examples include B. subtilis, E. coli, and L. acidophilus.

Biosafety Level 2 (BSL 2):

Organisms are agents of moderate potential hazard to laboratory personnel and the environment. Examples include Salmonellae, Hepatitis B virus, bloodborne pathogens, and human body fluids - particularly when visibly contaminated with blood.

Biosafety Level 3 (BSL 3):

Organisms are indigenous or exotic agents which may cause serious or potentially lethal disease and present the potential for aerosol transmission. Examples include H5N1 Influenza virus, Bacillus anthracis, Yersinia pestis, Burkholderia, Francisella tularensis, Brucella, Clostridium botulinum, Mycobacterium tuberculosis, Coxiella burnetii, Hantavirus, and West Nile virus.

Biosafety Level 4 (BSL4):

Organisms are highly pathogenic and require handling in special laboratory facilities designed to contain them. Examples include viral hemorrhagic fevers, such as Ebola, Lassa fever, Hantavirus pulmonary syndrome (HPS) and hemorrhagic fever with renal syndrome (HFRS).

I. Spills inside the laboratory

In the event of a Biosafety Level 1 spill:

1. Notify laboratory supervisor and/or personnel in the area and restrict access to the spill area to prevent the remainder of the laboratory from becoming contaminated.
2. Get the Spill Kit and put on the appropriate personal protective equipment (PPE): lab coat, eye protection, and gloves.
3. Place paper towels or other absorbent paper product over an area twice the area of the spill.
4. Spray the paper towels or other absorbent with freshly prepared 10% bleach solution, or other approved sterilization product.
5. Allow the absorbent material and sterilization compound to set on spill for twenty to thirty minutes.
6. During the twenty to thirty minutes sterilization period, prepare the 'biohazard' bag by opening the bag and folding it down from the top so that a wide opening is created and contamination of the outside bag surfaces during filling is prevented.
7. When the contact time is up, put the soaked towels or absorbent material in the 'biohazard' bag. Use forceps, tongs, or broom to remove any broken glass and other items; place in sharps container.
8. Wipe up any remaining spill residue with clean paper towels and place them in the 'biohazard' bag. Clean the spill area again with the fresh 10% bleach solution or other approved sterilization product. Place the paper towels in the 'biohazard' bag when finished.
9. Remove gloves, taking care not to touch the outside surfaces of the gloves with your bare hands, and then place them in the 'biohazard' bag.
10. Wash hands, thoroughly.
11. Inform laboratory supervisor and/or personnel when the clean-up is complete.

For a Biosafety Level 2 Spills:

Follow the procedures for a Biosafety Level 1 spill, but take extra precaution if needles or broken glass are involved.

For Biosafety Levels 3 and 4 Spills:

1. Hold breath and quickly leave the lab.
2. Immediately notify the Environmental Health, Safety and Risk Management Department and give the following accident details:
   - location
   - pathogen or microorganism involved
   - whether or not any individual was affected (contaminated) by the spill
3. Limit access to the area. Do not allow anyone other than EHS&RM in to the area.

II. Spills inside the Biosafety Cabinet:

MINOR SPILL: In the event of a small spill within the BSC, handle immediately:

1. Cover the spill with fresh 10% bleach solution or other approved sterilization product, allow it to sit for twenty to thirty minutes, depending on the size of the spill, and then wipe it up with a paper towel or other absorbent.
2. Remove the contaminated absorbent paper towel and place it in a 'biohazard' bag inside the BSC.
3. Wipe the surface again with sterile water and clean paper towels to remove any residual bleach, and then place the paper towels in the 'biohazard' bag.
4. Wipe up any splatter on items within the cabinet, as well as the cabinet interior, with a paper towel moistened with fresh 10% bleach solution or other approved sterilization product.
5. Remove contaminated gloves and wash hands.
6. Put on clean gloves and return everything to the cabinet.

MAJOR SPILL: In the event of a spill large enough to result in liquids flowing through the front or rear grilles require more extensive decontamination:

1. Leave the cabinet blower ON.
2. Decontaminate the surface of all items inside the BSC using freshly prepared 10% bleach solution or other approved sterilization product while removing them from the cabinet.
3. Pour the 10% bleach solution or other approved sterilization product onto the BSC work surface and through the grill(s) into the drain pan.
4. Allow twenty to thirty minutes for decontamination to take place. The amount of time varies according to the pathogen or microorganism involved.
5. Wipe the work surface with paper towels or other approved absorbent and place into the 'biohazard' bag.
6. Use clean paper towels moistened with sterile water to wipe down BSC surfaces again so as to remove any residual bleach solution, and then place paper towels in the 'biohazard' bag.
7. Empty the contents of the drain pan into a container that has some of the fresh 10% bleach solution or other approved sterilization product.
8. Attach flexible tubing to the drain valve. Tubing should be long enough to allow the open end to be submerged in the disinfectant inside the container mentioned above. This technique minimizes aerosol generation.
9. Thoroughly rinse the drain pan with water and drain the contents through the tubing. Remove drain tubing.
10. Remove gloves and wash hands.
11. Put on clean gloves and return everything to inside of BSC.

III. Spills inside a centrifuge

- Shut centrifuge off and do not open the lid for 20 minutes to allow aerosols to settle.
- Put on PPE.
- Use a squeeze bottle to apply disinfectant to all contaminated surfaces within the chamber, taking care to minimize splashing.
- Allow 30 minutes contact period and then complete clean-up of the chamber.
- Remove buckets and rotors to nearest BSC; disinfect and clean as per manufacturer's instructions.

IV. Spills outside the laboratory

- Viable organisms should only leave the laboratory in a well sealed primary (inner) **and** secondary (outer) container with a closable top. A test-tube rack inside a tray is **not** acceptable.
- The exterior of the secondary container should be wiped down with disinfectant prior to leaving the laboratory so that it can be transported without wearing gloves.
- Carry paper towels and if a spill occurs use the towels to cover the spill but do not attempt a clean-up without appropriate disinfectant and personal protective equipment.
- Notify people in the immediate area and collect clean-up material and proceed with clean-up.