Biohazardous Spill Response

General Guidelines

- A majority of spills with biological agents can and will be handled by trained laboratory personnel directed by a Principal Investigator.
- All laboratory staff must be trained in the lab’s spill clean-up procedure and know the location of the spill kit.
- Spills should never be cleaned up by untrained staff. Caretakers are not allowed to clean up any lab spills. Do not plan to borrow the caretaking mop to clean-up spills.

Basic Biological Spill Kit Contents

- A labelled 5-gallon pail with a lid – use this to store materials and to act as a waste pail in the event of a spill.
- The laboratory’s Spill Clean-up Procedures, a list of Emergency Contact Numbers and the U of M Post Exposure Chart stored in a plastic sleeve.
- Universal absorbent pads and paper towels: a mop and bucket are also an additional option.
- Freshly made household bleach is generally an effective general decontaminate – OR- You may have a lab-specific alternate. For Household Bleach, (5.25% hypochlorite)
  - on solid surfaces use a 1/5 dilution = 1% final concentration = 1 part bleach to 4 parts water
  - for liquids, dilute with concentrated bleach to a final 1% concentration
- Disposable nitrile gloves (at least two pairs per person) and one pair reusable chemically resistant gloves.
- A face shield –or- non-vented splash goggles and face masks.
- In addition to a lab coat and full shoes, consider a back closing gown to wear over the lab coat and possibly disposable arm-covers and shoe covers. A full moisture resistant (e.g. TYVEX) jumpsuit maybe appropriate in some situations.
- Dustpan, brush and/or squeegee – disinfectable or autoclavable. For example an inexpensive plastic set can be autoclaved or treated with bleach and disposed after use.
- Autoclave bags in a variety of sizes.
- Forceps and/or a pair of tongs to pick up sharp objects and an autoclavable sharps container.

Biohazardous Spill inside a Biosafety Cabinet (BSC)

1. Leave the cabinet running to prevent the escape of contaminants from the cabinet.
2. For spills just on the working surface, cover the spill with paper towels and gently flood the surface with your chosen disinfectant. If you are working in the cabinet you should already have this available. Start at the outside and move to the centre. Be careful not to generate any splashes or aerosols.
3. If the spilled material has run through the front or back grills into the catch basin which is located under the BSC work surface, you will need to decontaminate those surfaces as well. The procedure you follow for this will depend on the volume, concentration and hazard of the material that has spilled into this area. Refer to the discussion at the end.
4. Let the disinfectant stand on the spill for a minimum of 15 minutes or longer as per you local procedure. If you need to leave the area during this time you will need to disinfect and remove your gloves inside the cabinet. Then remove your lab coat and any other protective equipment and carefully wash your hands.
5. When you return to clean up the decontaminated area, put on your lab coat and gloves again and make sure you have an autoclave bag available in the BSC. A double pair of clean gloves or extra clean gloves inside the BSC may be needed. Depending on the size and type of spill you may also want to put on disposable arm covers or a back closing gown.
6. After the allotted time remove the disinfectant soaked paper towels into an autoclave bag. As much as possible, ensure that the disposal container and your arm movements are all located inside the BSC. Use tongs for this if available. It is a good practice to touch the towels as little as possible.
7. Definitely use forceps to pick up any broken or sharp material and place them into an approved sharps container.
8. When all the absorbent material is packaged, remove your outer gloves and dispose of them in an autoclave bag.
9. Spray or wipe all the interior cabinet surfaces and any remaining equipment and supplies which are located inside the BSC with disinfectant. Alternate these supplies to an autoclave bag located inside the cabinet. Close the bags and then surface disinfect them before removing them from the BSC for autoclaving.
10. If bleach solution has been used on stainless steel, rinse all surfaces really well with water. You can also re-wipe with 70% alcohol.
11. Let the cabinet run for at least 10 minutes after clean-up.
12. To remove decontaminated liquid from the catch basin, you may need to remove the working surface and repeat the steps. If the spill is so large that it cannot be comfortably handled with a reasonable amount of paper towels you may have to flood the catch basin with disinfectant and then after waiting the required time, drain the liquid from the catch basin using the stop-valve located underneath the pan. Re-wipe all surfaces with disinfectant, including the underside of the work surface before replacing it. The spent decontaminant should be disposed thorough the safety office.
13. You can view a variety of spill clean-up techniques in the biosafety cabinet on the videos at. http://vimeo.com/7642083;
**Biohazardous Spill Outside of a Biosafety Cabinet**

**Minor spills:**
- the release of Risk Group 1 organisms without splashing or agitation
- the release of a small volume (<100ml) and a low concentration of RG 2 organism

**Major Spills:**
- release of RG2 organisms with splashing or aerosolization
- release of large volume of RG2 organism
- a spill that requires additional assistance

1. **Assess the area for the severity of the incident.** For example, ask yourself the following questions:
   a. How pathogenic is the organism involved?
   b. What volume and concentration of biological material is involved?
   c. Do I have the experience to do this clean-up myself?

2. **Ensure your own personal safety** and tell other people in the vicinity.
   a. Clear the area of all non-essential personnel and ask for help if necessary.
   b. **For major spills, wait 30 minutes before re-entering the area to allow dissipation of aerosols created by the spill.**
   c. If available and safe, have someone set up signs or tape off the area to avoid people from entering the spill zone.

3. **As soon as possible, deal with personal or co-worker injuries or potential injuries.**
   a. Assess the area for personnel contamination. Remove any contaminated items and put them in an autoclave bag.
   b. Initiate first aid if required: Wash the exposed area well with gentle soap and water.
   c. Encourage bleeding if the exposure includes a sharps injury, or puncture and repeat washing. For eye exposures flush eyes for 15 minutes in eye wash. Seek medical attention.
   d. If the incident involves a potential exposure of human blood, body fluids or cell lines due to broken, cut, punctured or non-intact skin, initiate the post exposure protocol and ensure that you seek medical attention within two hours.
   e. Ensure that the exposure is reported to your supervisor as soon as possible.

4. **Ensure you are wearing adequate PPE for the clean-up.**
   a. Double gloves, lab coat, close-toed shoes, and covered legs is minimum.
   b. For major spills: Consider protection from shoe covers, arm guards, face protection/shield and/or back closing gowns.
   c. If the incident involves a potential exposure of blood, body fluids, cell lines ensure adequate skin coverage and wear a full face shield. Refer to SWP BBF.
   d. For respiratory transmitted organisms, the PI should determine whether an N100 or HEPA filtered respirator is required for the spill kit. These require fit testing and a consult with EHSO.

5. **Attend to the spill**
   a. Contain the spill with absorbent material from your spill kit. For example gently cover the spill with paper towels or absorbent. Determine the extent of the splashed area and cover it all with paper towels as well.
   b. Gently pour disinfectant on the absorbent paper starting at the outside and moving to the centre.
   c. For very large spills, an alternate method is to soak towels in disinfectant and gently lay them on the spilled area.
   d. Let stand 30 minutes to allow an adequate contact time.

6. **While waiting, to avoid contaminating yourself:**
   a. Remove your outer layer of gloves and then all contaminated clothing and PPE and place them in an autoclave bag for later autoclaving.
   b. Remove the inner pair of gloves and carefully wash your hands with soap and water.

7. **Replace any removed PPE and prepare to clean-up the decontaminated spill.**
   a. Pick up contaminated broken glassware with a brush and dustpan, tongs or forceps; not directly by hand. Place in a sharps container for autoclaving.
   b. Using a disposable dust pan and squeegee or tongs, transfer all materials soaked in disinfectant into a new separate autoclave bag. The 5 gallon pail can be used as a support for this bag. Chemically disinfected material does not need to be autoclaved but is still considered chemical waste.
   c. Reapply disinfectant to the spill area after the initial clean-up. Wait for the required time and then clean-up again.
   d. Disinfect/decontaminate the surface of any items or equipment in the vicinity of the spill that may have been exposed.
   e. When finished, secure the lid on the 5 gallon pail. Label the container appropriately with a chemical waste tag, place it in a secure location and arrange for disposal through EHSO. 474-6633
   f. Carefully remove all PPE. Place in a different bag for autoclaving or if applicable, carefully surface disinfect. Lab coats used for spill clean up must be autoclaved before laundering.
   g. Thoroughly wash your hands.

8. **It is important that you report the incident to your supervisor** and complete a green card. Written records of such incidents must be maintained, and the results of incident investigations should be used for continuing education

9. **Make arrangements to restock items used in the spill kit.**