

## CLEANING UP SPILLS OF BIOHAZARDOUS MATERIALS

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(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

**Definition:** *Biohazardous materials are infectious agents or biologically-derived infectious materials that present a risk or potential risk to the health of humans, animals, plants, or the environment. The risk can be direct through infection or indirect through damage to the environment.*

Biohazardous materials include certain types of recombinant DNA; organisms and viruses infectious to humans, animals or plants (e.g., parasites, viruses, bacteria, fungi, prions, rickettsia); and biologically active agents (i.e., toxins, allergens, venoms) that may cause disease in other living organisms or cause significant impact to the environment or community. Bloodborne pathogen source materials, such as human blood and certain body fluids as well as human or monkey cell cultures, are also considered biohazardous materials. For spills involving bloodborne pathogens, please refer to the EHS SOP, ***Cleaning up Spills of Bloodborne Pathogens***.

Spills involving biohazardous materials create exposure hazards. Exposure routes generally include absorption through the skin, especially if the skin is broken or irritated; inhalation if the spill created aerosols that may have dispersed in the air throughout the laboratory; contact with mucous membranes from aerosols or splashes; and accidental ingestion through hand-to-mouth contact. Use of appropriate personal protective equipment is particularly important in decontaminating spills involving human pathogens.

Recommendations for assembly of a basic Biohazard spill kit is provided as an addendum to this SOP.

### ***Spills Involving Microorganisms and Infectious Materials*** *(Except Toxins)*

#### **Personal Protective Equipment (PPE) & Supplies**

- Impervious outer garment, such as tyvek coveralls or lab coats (depending on spill volume)
- Impervious boot covers
- Full face shield or goggles and mask

- Disposable gloves
- Respiratory protection
- Disposable paper towels or other suitable absorbent (e.g., diatomaceous earth, kitty litter, commercially-available spill material, etc.)
- Freshly-prepared 10% household chlorine bleach solution (1 part bleach and 9 parts water; or add ½ cup of bleach to 1 quart of water) or a disinfectant approved for the specific agent

The appropriate ensemble of PPE to be used when cleaning up a spill depends on the severity of the spill and the microorganism. Risk Group 2 agents are recognized human pathogens. Risk Group 3 agents are severe human pathogens and are infective by the inhalation route.

If the spill is small and involves a Risk Group 1 or 2 agent, a lab coat is usually sufficient as an outer garment so long as it is unlikely that the lab coat can become saturated with the spilled material. Impervious coveralls are appropriate if the spill is large and it is likely that the outer garment can become significantly saturated or if the spill involves a Risk Group 3 agent.

Likewise, the appropriate eye protection depends on the severity of the spill. If splashing is likely, as with large spills, goggles and a face shield are appropriate to protect mucous membranes (e.g., eyes, nose and mouth). If the spill is small and splashes are unlikely, safety glasses with side shields are appropriate.

Other protective gear may be appropriate depending on the circumstances. For example, rubber boots are appropriate if you must step into or transverse areas where the spill occurred. Respiratory protection is required if the spill involves a Risk Group 3 agent.

### **Procedures**

- Alert others to the spill. If someone is available to provide assistance, have them provide surveillance so that people don't wander into the spill area.
- If assistance is needed because the spill is unusually large, it involves additional hazards or a Risk Group 3 agent, or clean-up materials are not available, contact EHS at 472-4925 or the campus operator at '0' to mobilize additional qualified persons to provide assistance.
- Gather necessary supplies and don appropriate PPE.
- As necessary, create a berm around the spill to prevent additional spreading.
- Remove contaminated sharps (e.g., broken glass) from the spilled material and place in a rigid, water-tight container. Use a mechanical device such as tongs to pick up sharps. **Do not use your hands.**

- Spread the absorbent material (e.g., paper towels, diatomaceous earth, kitty litter, commercially-available spill material, etc.) over the area of the spill, working from the outside edges toward the middle.
- Allow the absorbent to soak up the liquid and carefully place it into a biohazardous waste receptacle.
- Treat the spill area with a **freshly-prepared** 10% solution of household bleach or other agent-specific disinfectant. It is best to gently pour the bleach solution on the spill area, as opposed to spraying, since spraying could create aerosols.
- Allow the bleach/disinfectant to stay in contact with the surface for at least twenty minutes. After twenty minutes, absorb any remaining bleach/disinfectant solution on paper towels or other absorbent and place into a biohazardous waste container.
- Clean the affected area with soap and water.
- Remove personal protective equipment and thoroughly wash hands, arms, face, and any other exposed body parts. Disinfect non-disposable PPE.
- If you haven't already done so, notify your supervisor of the spill.

### ***Spills Involving Biological Toxins***

#### **Personal Protective Equipment**

- Lab coat
- Full face shield or goggles and mask
- Disposable gloves
- Disposable paper towels or other suitable absorbent (e.g., diatomaceous earth, kitty litter, commercially-available spill material, etc.)
- Use 2N NaOH or other decontaminant proven to be effective against a specific toxin.

#### **Procedures**

- Create a berm or dike with absorbents.
- Treat the spill area with the 2N sodium hydroxide. Allow a contact time of one hour.
- Remove personal protective equipment and thoroughly wash hands, arms, face, and any other exposed body parts.
- Tag spill residues for collection by EHS. Clean PPE or containerize and tag for collection by EHS.
- Clean area with soap and water.
- If you haven't already done so, notify your supervisor of the spill.



# Biohazard Spill Kits

All labs conducting experiments involving the use of biological materials should have a properly stocked biohazard spill kit available and accessible at all times. These kits are especially important for labs designated as Biosafety level 2 or labs conducting experiments with large volumes of biological materials.

## Basic Biohazard Spill Kit Contents

1. Nitrile or latex gloves (several pairs can be used for double gloving)
2. Lab coat or disposable gown
3. Goggles or face shield to prevent splashing of disinfectant or agent into mucous membranes
4. Disposable shoe covers
5. Small disposable broom with dust pan, tongs, or forceps
6. Red medical waste/biohazard bags
7. Disinfectant suitable for the biologically hazardous materials found in the lab. (Most often this is a container of household bleach (< 1 year old) and a spray bottle to make up a fresh 10% solution.)
8. Absorbent materials (i.e., paper towels)
9. Diking material or spill pillows for large spills (stops the spread of a spill)
10. Signage to post at lab entrance for controlling access (provided on next page)
11. Copy of this SOP.

NOTE: This information is for a basic kit only and may serve your purpose. However, a careful risk analysis of the biological hazards found in your particular laboratory may require additional items not found on this list. For information regarding this please contact UNL Biosafety Officer at 2-9554

All of these items can be stored in a five (5) gallon bucket with a lid. The bucket can also serve as a container for mixing disinfectant used in the clean up. The bucket should be labeled indicating this is a biological spill kit. The contents of this kit should be checked on at least annually to make sure the kit is complete and the components are in usable condition (i.e. bleach is <1 yr old and PPE is intact).



*BIOHAZARD*

*SPILL*



**Do Not Enter!**