BGSU's Biosafety and Infectious Waste Safety Procedures

Environmental Health & Safety
1851 N. Research Drive
Bowling Green, OH 43403
419-372-2171

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Foreword

In 1970, the United States Congress established the right of workers to "safe and healthful working conditions" through the Occupational Safety and Health Act. This act created the Occupational Safety and Health Administration (OSHA). In July, 1994 the State of Ohio adopted and incorporated by reference many of the Federal OSHA standards through the Public Employee Risk Reduction Act, Ohio Revised Code 4167.07. This act and its subsequent rules (Ohio Administrative Code 4167-3-01) required Bowling Green State University and other state institutions to comply with all applicable OSHA standards.

The Biosafety and Infectious Waste Safety Procedures in this document have been established by Bowling Green State University to comply with Ohio's Public Employee Risk Reduction Act, the U.S Department of Health and Human Services manual on "Biosafety in Microbiological and Biomedical Laboratories", the NIH Guidelines for Research Involving Recombinant or Synthetic DNA Molecules, the OSHA Occupational Exposure to Hazardous Chemicals in Laboratories Standard 29 CFR 1910.1450, and the OSHA Personal Protective Equipment Standards of 29 CFR 1910 subpart I.

Certain safety and health hazards exist in the University laboratories and must be addressed. Everyone involved in any aspect of lab functioning has a legal and moral responsibility to act in such a way to reduce risks from potential hazards in the laboratory.

The procedures are designed to accommodate the specific laboratory activities relevant to biohazardous material on campus and to minimize unnecessary burdens placed on departments or researchers. Although the tasks of using biohazardous material are more specialized than general laboratories, it is important to understand that the respective laboratory is still responsible to establish general safe operating procedures and provides guidelines for the development of specific laboratory procedures, per the BGSU Laboratory and Chemical Hygiene Plan. The responsibility for ensuring safety in the laboratory ultimately rests with the individual in charge of that laboratory.

Ensuring safety through health hazard reduction should be viewed as a good prudent professional practice, not as merely an additional administrative requirement. Risks can never be reduced to zero, but by practicing simple and safe laboratory procedures, they can be reduced dramatically. The intent of these procedures are to help laboratories using biohazardous material to reach a level of safety and risk minimization that is entitled to all workers.

Biosafety Procedures

Overview

All laboratories using biological substances for research activities, no matter what level of hazard, need to abide by the Environmental Health and Safety's Lab Safety and Chemical Hygiene Plan. All biological waste generated by these laboratories need to follow written procedures established by the Environmental Health and Safety Hazardous Waste Management procedures. Additionally, guidelines and regulations outlined by the Institutional Biosafety Committee (IBC) may have to be followed.

Prior to purchasing biological agents for a non-designated laboratory for the first time, a written request is required to be sent to the IBC. Furthermore, if an approved lab is wanting to use agents in a higher level than permitted, they will have to submit a new proposal to the IBC. Once approved, the requestor must follow BGSU Purchasing protocol for purchasing hazardous goods.

The laboratory director is specifically and primarily responsible for the safe operation of the laboratory. His/her knowledge and judgment are critical in assessing risks and appropriately applying these recommendations. The recommended biosafety level represents those conditions under which the agent can ordinarily be safely handled. Special characteristics of the agents used, the training and experience of personnel, procedures being conducted and the nature or function of the laboratory may further influence the director in applying these recommendations.

The following requirements and definitions are derived from the guidelines defined by the BGSU IBC. The Department of Environmental Health and Safety, although part of the approval process, refers to the IBC to determine whether or not laboratories requesting BSL-1 or BSL-2 specimens meet these requirements. Please refer to the most updated requirements by visiting the Office of Research Compliance website.

Biosafety Level 1 (BSL-1)
BSL-1 is suitable for work involving well-characterized agents not known to consistently cause disease in immunocompetent adult humans, and present minimal potential hazard to laboratory personnel and the environment. BSL-1 laboratories are not necessarily separated from the general traffic patterns in the building. Work is typically conducted on open bench tops using standard microbiological practices. Special containment equipment or facility design is not required, but may be used as determined by appropriate risk assessment. Laboratory personnel must have specific training in the procedures conducted in the laboratory and must be supervised by a scientist with training in microbiology or a related science.

Biosafety Level 2 (BSL-2)
Primary hazards to personnel working with BSL-2 agents relate to accidental percutaneous or mucous membrane exposures, or ingestion of infectious materials. Extreme caution should be taken with contaminated needles or sharp instruments. Even though organisms routinely manipulated at BSL-2 are not known to be transmissible by the aerosol route, procedures with aerosol or high splash potential that may increase the risk of such personnel exposure must be conducted in primary containment equipment, or in devices such as a BSC or safety centrifuge cups. Personal protective equipment should be used as appropriate, such as splash shields, face protection, gowns, and gloves.

Biosafety Level 3 (BSL-3)
BGSU **does not** have any laboratories authorized for use of BSL-3 agents.

BSL-3 is applicable to clinical, diagnostic, teaching, research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease through the inhalation route of exposure. Laboratory personnel must receive specific training in handling pathogenic and potentially lethal agents, and must be supervised by scientists competent in handling infectious agents and associated procedures.

Biosafety Level 4 (BSL-4)
BGSU **does not** have any laboratories authorized for use of BSL-4 agents.

BSL-4 practices, safety equipment, and facility design and construction are applicable for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available vaccine or therapy. Agents with a close or identical antigenic relationship to BSL-4 agents also should be handled at this level. When sufficient data are obtained, work with these agents may continue at this level or at a lower level. Viruses such as Marburg or Congo-Crimean hemorrhagic fever are manipulated at BSL-4.

The primary hazards to personnel working with BSL-4 agents are respiratory exposure to infectious aerosols, mucous membrane or broken skin exposure to infectious droplets, and autoinoculation. All manipulations of potentially infectious diagnostic materials, isolates, and naturally or experimentally infected animals, pose a high risk of exposure and infection to laboratory personnel, the community, and the environment.

The laboratory worker's complete isolation from aerosolized infectious materials is accomplished primarily by working in a Class III BSC or in a full-body, air-supplied positive-pressure personnel suit. The BSL-4 facility itself is generally a separate building or completely isolated zone with complex, specialized ventilation requirements and waste management systems to prevent release of viable agents to the environment.

Infectious Waste and Autoclave Procedures

The purpose of the procedures listed below are to outline the proper protocols implemented at BGSU for the safe use of autoclaves to treat hazardous biological waste. Chemical waste is strictly prohibited. This is in guidance with the latest version of the Ohio EPA regulations, per the Ohio Administrative Code Chapter 3745-27 and other hazardous waste regulations.

Storage of Infectious Waste

All waste shall be placed in either an autoclave bag or sharps container labelled with the biohazard symbol. Bags shall be kept tied shut and sharps containers kept closed. There should not be holes in any of the biohazard bags. All infectious waste shall be stored in a designated storage area that is either kept locked or visibly labelled with a sign stating "Warning: infectious waste" or with the international biohazard symbol at all points of access. Infectious waste must be protected from animals and does not provide a breeding place or food source for insects or rodents. Waste shall be stored no more than 14 days. The volume of waste stored should be no more than seven times what the treatment facility can autoclave in one day.

Departmental Infectious Waste Disposal Procedures

If biohazardous waste is generated on-campus, it needs to be disposed of responsibly. It may be autoclaved if the material is handled properly. It should also be noted that the respective department for the autoclave being used to treat the waste may charge a fee to the department for disposal.

To ensure that the biohazardous or infectious waste is being cared of properly and that personnel handling the waste are kept safe, listed below are the procedures that need to be followed when accumulating or treating biohazardous or infectious waste at Bowling Green State University.

1. Waste accumulation areas, including the containers used for collecting waste, need to be labeled properly. This includes signs posted stating that the waste bin is for biohazardous waste and ensuring that waste bags used are labeled biohazardous.
2. If you are generating waste in the same building as the autoclave you will be dropping waste off at, you may personally walk the waste to the autoclave. If you are generating waste in a building other than where the autoclave is located, you may contact Environmental Health and Safety (2-2171) to ensure the waste is delivered properly.
3. Biohazardous and infectious waste bags will be rejected if over-filled or if leaking upon arrival to the autoclave.
4. The manager of the autoclave needs to log what type of waste is being autoclaved. It is imperative that the generator records this information once the waste is dropped off.

Spill Containment and Cleanup

The procedures outlined below shall be followed in the event of a biological spill or accident (unless the quantity of such spills are less than one cubic foot of waste or less than one half the contents of a container with a maximum capacity of two cubic feet).

Call for emergency help as needed from the autoclave coordinator/department contact, the Environmental Health and Safety office on campus, or the BGSU police department. See the emergency phone numbers section for numbers outside of the University.

EH&S Specialist	Life Science Coordinator	Moseley Hall Coordinator
Jeremy Dick	Sheila Kratzer	Emily Barnes Hanna
Env. Health & Safety	Department of Biology	Medical Laboratory Science
(419) 372-2131	(419) 372-8609	(419) 372-8554
(419) 372-2171 EHS office	(419) 372-2332 Biology Dept	(419) 372-8724 Dept. Office

Emergency Telephone Numbers

BGSU Biology Department ……. (419) 372-2332

BGSU Microbiology Prep Room ……. (419) 372-8609

BGSU Health and Human Services Department……... (419) 372-8724

BGSU Environmental Health and Safety..... (419) 372-2171

BGSU Police Department.....(419) 372-2346

The emergency response companies that may be contacted in the event of an infectious waste spill are:

Environmental Management Specialists, Inc.

419-386-2331 (Office)

877-816-9111 (24/7 Dispatch)

Rader Environmental Services

419-424-1222 (Office)

419-408-1169 (Joe Rader)

419-408-1171 (Bruce Deppen)

Implementation of Response

BIOLOGICAL SPILLS or LEAKS

1. Evacuate to a safe distance.

2. CALL 911 – Give location and description of material.

3. Prevent access to area until response team arrives.

4. If biological material contacts eyes or skin, flush immediately and continuously for at least 15 minutes. Use eye wash station, safety shower or other water source.

Spill Procedures

1. CLEANUP KIT is required to be available for the autoclave and suggested as a best practice for individual laboratories. An example of what a cleanup kit may contain include:

A. HAZORB SPILL ABSORBENT.

B. DISINFECTANT - 10% household bleach solution – make fresh as needed

C. BIOHAZARD BAGS (a minimum of 10)

D. FIRST AID KIT and FIRE EXTINGUISHER

E. PROTECTIVE BODY EQUIPMENT (a minimum of one set)

Disposable overalls	Gloves	Boundary tape
Disposable boots	Disposable caps	Protective eye wear
Duct tape		

2. LIMIT ACCESS TO SPILL AREA

Limit access to spill area to clean-up crew and personnel from Environmental Health and Safety. Seal off area with boundary tape. Close room until spill area is disinfected.

3. BROKEN CONTAINERS

Minimizing the risk of exposure, place broken containers and spillage inside the appropriate infectious waste containers.

4. ABSORB SPILL

Hazorb absorbent should be gently tossed on spill area so that spill is covered. Area should be left untouched just long enough for spilled liquid to be absorbed. Clean up all solids and liquids with disposable paper towels. After use the absorbent material and paper towels shall be considered infectious waste. These materials should be placed in the biohazard bag for treatment as infectious waste while minimizing exposure to cleanup personnel.

5. DECONTAMINATE AREA

Decontaminate area by flooding the area with a 10% bleach solution or other approved disinfectant. Allow the disinfectant solution to be in contact with the affected area for a minimum of 15 minutes.

6. CLEANING THE AREA

Wipe up the disinfectant with disposable paper towels. Place all disposable cleanup materials in biohazard bags.

7. DISINFECT ALL NON-DISPOSABLE EQUIPMENT.

All equipment that cannot be autoclaved should be sprayed with disinfectant. Allow disinfectant to contact the contaminated equipment for at least 30 minutes.

8. DISCARD PROTECTIVE EQUIPMENT AS INFECTIOUS

Remove personal protective equipment and place disposables in biohazard bags to be autoclaved as infectious waste.

9. AUTOCLAVE CLEANUP MATERIALS.

Once the cleanup is complete and all infectious materials are contained in biohazard bags - autoclave as infectious waste.

10. REPORT ALL INFECTIOUS SPILLS/ACCIDENTS

Report to the respective infectious waste coordinator within 48 hours using the accident/spill form, unless the quantity of such spills are less than one cubic foot of waste, or less than one half the contents of a container with a maximum capacity of two cubic feet. Any infectious waste spill outside of the limited access areas shall be reported.

11. RECORD ALL SPILLS/ACCIDENTS INVOLVING INFECTIOUS MATERIALS IN SPILL LOG

All spills related to the autoclave shall be recorded in the Spill Log located in the Facility Management Plan binder. Maintain records for a minimum of three years.

12. REPLENISH CONTAINMENT AND CLEANUP KIT.

Sources

Laboratory Biosafety Manual. 3rd ed. Geneva: World Health Organization; 2004.

Sewell, David L. "Laboratory-associated infections and biosafety." *Clinical Microbiology Reviews* 8.3 (1995): 389-405.

American Biological Safety Association. ABSA Biosecurity Task Force White Paper: Understanding Biosecurity. Illinois: The Association; 2003.

http://www.absa.org/0301bstf.html

Biosafety in Microbiological and Biomedical Laboratories, 5th ed. Washington, DC, United States Department of Health and Human Services/Centers for Disease Control and Prevention/National Institutes of Health, 2009.