BIOLOGICAL SAFETY MANUAL

August 2023

Biological Safety Manual

I. Introduction

This manual provides procedures and guidance for the safe handling and disposal of biological materials at the University of Northern Colorado

Human Blood and Other Potentially Infectious Materials

Experimentation or manipulations of human blood or other materials of human origin, including, but not limited to, excreta, secreta, blood and its components, unfixed tissue, and tissue fluids, all of which may or may not contain an infectious agent, may place the worker at risk of exposure to blood borne pathogens.

Examples which could result in exposure would be research labs performing experiments and/or manipulations with human blood or unfixed tissues or organs, or a maintenance worker repairing a sewer line getting contaminated with human blood or other potentially infectious materials.

Infectious Agents and Materials

Infectious agents, pathogens or substances are defined as those substances containing viable microorganisms or their toxins which are known or suspected to cause disease in animals, plants or humans. Pathogens are classified as bacteria, fungi, rickettsiae, viruses, parasites, oncogenic viruses, and prions.

Any materials which come in contact with infectious agents or their byproducts must be handled and disposed of in the same manner appropriate for disposing of the infectious agents themselves.

Recombinant DNA Molecules and Products

Research involving experiments with recombinant DNA materials includes, but is not limited to: commonly used host-vector systems such as ; recombinant DNA experiments using whole animals or plants; recombinant DNA or RNA experiments involving infectious animal or plant viruses; the production of transgenic animals; and the deliberate transfer of DNA or RNA into human subjects (requires human studies approval and approval from federal agencies, including NIH). Regardless of the cloning method utilized, precautions must be taken to assure that the systems neither cause disease in the operator nor release recombinant molecules into the environment.

Miscellaneous Biohazard Materials

These include materials not directly covered by the above definitions, such as allergens, cultured animal cells and their potentially infectious agents, tissues

Select Agents

Select agents are pathogens or biological toxins which have been declared by the U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, or by the U.S. Department of Agriculture to have the "potential to pose a severe threat to public health and safety".

III. Blood Borne Pathogens / Infectious Agents

Bloodborne Pathogens standard (29CFR 1910.1030) applies to all employees with reasonably anticipated skin, eye, mucous membrane, or parenteral contact with human blood, blood components, or other potentially infectious materials.

Types of Biological Infectious Waste

The Environmental Protection Agency Medical Waste Tracking Act and Colorado Department of Public Health and Environment have developed regulations and a list of infectious waste categories. Included in these categories are:

1. Human Blood & Blood Components

   Human blood, products of blood, items saturated, dripping or caked with blood, including body fluids consisting of saliva, semen, vaginal secretions, serum, plasma, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid. Intravenous bags and containers which were used or intended for patient care, testing and laboratory analysis or in the development of pharmaceuticals.

2. Isolation Waste

   Waste generated from humans or animals infected with certain highly communicable diseases isolated to protect others from potential infectious risks.

3. Cultures and Stocks - Medical/Pathological

   Cultures and stocks of infectious agents and associated biologicals from research, industrial, medical and pathological laboratories; waste from the production of biologicals; discarded live and attenuated vaccines; culture dishes and devices used to transfer, inoculate and mix cultures.

4. Pathological Wastes

   Pathological / anatomical waste consisting of cell, tissues, organs, and body parts removed from surgical, autopsy, obstetrical, laboratory and other medical procedures; specimens of body fluids and their containers.

5. Sharps

   Sharps used in animal or human patient care including: hypodermic needles, syringes, lancets, blades, scalpels, pipettes, glass microscope slides, cover slips, glass tubes, blood vials, broken capillary tubes, razor blades, exposed ends of dental wires and other discharged metallic items.

6. Animal Waste

   Animal carcasses, body parts, bedding of animals exposed to infectious agents during research and analysis, veterinary care, production of biologicals or testing of pharmaceuticals.

7. Miscellaneous Waste

   Waste generated from patient or animal care such as contaminated gloves, Petri-dishes, culture instruments, plastics, soiled dressings, sponges, drapes, drainage sets, lavage tubes, under pads and specimen containers.

Any wastes described in these categories must be properly handled, and disposed of in a proper manner.

Biohazard Bags and Containers

Infectious waste must be placed in red biohazard bags. Biohazard bags that are full shall not be forced into a secondary container as this could cause breakage or leakage. Biohazard containers will have a red biohazard liner. Containers will not be overfilled so the container cannot be closed, secured or sealed for transportation and disposal. Each biohazard bag and container must have an International Biohazard Symbol (Figure 1).

Waste Locations

There is a potential for biological infectious waste, as defined in the previous section, to be generated at any facility or location on the university's campus. Therefore, there are multiple sites where bio-hazardous waste containers may be located. Some permanent biohazard waste container locations can be found in Appendix A of this document.

Sharps

International Biohazard Symbol – Figure 1

Do NOT place Non-Biohazard Waste (general trash) into Biohazard Containers

IV. Responsibilities

Environmental Health & Safety

Environmental Health and Safety (EHS) is primarily responsible for the implementation of the Biological Safety Program. The Director of EHS is the University's Biological Safety Officer, and is responsible for the implementation and updates to this manual. Duties of the EHS department may include:

1. Monitor compliance practices and procedures regarding potentially infectious and biohazard materials.

2. Assist in the periodic updating of the Biological Safety Manual which is consistent with Federal, State and local regulatory guidelines.

3. Provide information on matters relating to laboratory safety, appropriate handling and containment of biohazard agents, decontamination, and disposal of biohazard wastes.

4. Aid in the development of appropriate emergencmt

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4. Post working areas and facilities with biohazard warning signs. The PI should consult EHS if assistance is required in placement of signs.

5. Arrange for immunization and/or health surveillance of laboratory personnel if deemed appropriate for the research project.

Deans and Directors

1. The Dean and Director are responsible for the general safety of faculty, staff, and students working with biohazard agents in his/her overall area of jurisdiction.

2. The Dean, Director and PI are mutually responsible for informing UNC Police Department and EHS of work involving biohazard agents and reporting accidents or incidents involving such agents.

3. The Dean and Director shall determine that appropriate facilities and safety equipment are available for proposed research or instruction involving biohazard agents.

Laboratory Personnel

1. Laboratory personnel, including all staff, faculty and students, shall perform all

V. Principles of Biosafety

The fundamental objective of the Biosafety program is the containment of potentially

VI. Shipping, Packaging, and Transferring Biological Materials

This section will serve as a guide for shipping, packaging and transferring dangerous goods (such as infectious agents, biological materials, or diagnostic specimens). The U.S. Department of Transportation (DOT) requires those that ship or receive hazardous goods shall receive special training on the Shipment of Dangerous Goods. The materials must be packaged by Environmental Health and Safety (EHS) or personnel within the University who are trained specifically to package these materials.

Shipment Classifications

The Department of Transportation (DOT) Hazardous Materials Shipping Regulations (49 CFR 173.134) apply to anyone packaging or shipping Hazardous Materials by ground transportation.

The International Air Transport Association (IATA) Dangerous Goods Regulations apply to anyone packaging or shipping Dangerous Goods by air transport (any package which is offered to a major commercial carrier should be packaged for air transport).

1. Diagnostic specimen: Any human or animal material being shipped not known or suspected of containing a pathogen. This includes blood, blood components, tissue, and bodily fluids. Diagnostic specimens must be shipped with triple packaging explained below.

2. Biological Product: A biological product is a material prepared and manufactured in accordance with certain regulations of the Department of Agriculture or the Department of Health and Human Services (for example, vaccine preparations).

3. Infectious Substance: In hazardous goods regulations, "infectious substance" includes any toxin (classified as 6.1) or infectious agents (classified as 6.2) which affect humans or animals. This includes infectious agents listed in 42 CFR 72.3 of the Department of Health and Human Services regulations and any other agent that causes or may cause severe, disabling, or fatal disease. IATA and the DOT require compliance with Packaging Instruction 602 for Infectious Substances, which includes UN certified packaging, the "declaration of hazardous goods" documentation, and a 24-hour response number to provide information on package contents. UN Identification Codes must be also used correctly on the package and the shipping documents shall include:

   UN 2814 - Infectious substance, affecting humans. Specify (liquid) or (solid)
   UN 2900 - Infectious substance, affecting animals only. S

[redacted]sponsibilities and Requirements

[redacted]quirements for shipments of all Dangerous Goods:

[redacted]er must receive training in shipping dangerous goods. Shippers
[redacted]y responsible for the correct and legal transport of dangerous goods
[redacted] or air. Anyone who offers advice for transport or handles
[redacted] materials for transport must be trained. (49 CFR Part 172-
[redacted])

[redacted]er must use UN approved labels and packages.

[redacted]ational shipping, the Shipper must apply for Import or Export
[redacted]ee below).

[redacted]er must complete shipping documentation (2 copies, typewritten or
[redacted]generated).

[redacted]er must attach information to the Shipper's Declaration for
[redacted] Goods stating the hazards associated with the shipment (i.e.,
[redacted]afety Data Sheets).

[redacted]er must have a 24-hour Emergency Phone Number with
[redacted]n available about the shipment.

[redacted]sponsibility of EHS to assist in the packaging, shipping and
[redacted]f hazardous materials and dangerous goods.

[redacted]

Etiologic agents, infectious materials or vectors containing infectious agents that are imported from foreign locations outside the United States for domestic use (educational, scientific, commercial, etc.) are required to have an importation permit issued by the Health and Human Services Division (Center for Disease Control and Prevention – ofvmpon1 (i)6 (on)10 ( )]TJ0 (er)7 (f)2pi)5.9 (n)10 (g 9Tw ( )Tj-0)10.1

Primary container – Use screw-cap conical test tubes with adhesive tape around screw cap. Label tube with Biohazard label. Absorbent material must be placed between the primary and secondary container. The quantity of the absorbent material should be sufficient enough to absorb all liquid in the shipment.

1. Secondary Container – Includes a watertight plastic bag that seals.

2. Outer Shipping Container – Sturdy package (i.e., corrugated cardboard)

VII. Accidental Exposure / Emergency Response

If someone has been injured or is experiencing an emergency, contact:

UNC Police Communications: 911 (campus phone)
351-2245 (off-campus phone)

In the event a spill or contamination with potentially hazardous biological material has occurred contact:

UNC Police Communications: 911 (campus phone)
351-2245 (off-campus phone)

Describe any hazards and warnings to the Police Communication center. The UNC Police Communications Center will contact Environmental Health and Safety personnel.

Bloodborne Pathogen Cleanup Definitions

Below are a list of definitions for bloodborne pathogens cleanup.

1. BBP Small Spill: A volume that is easily managed with a minimal amount of decontamination equipment and materials.

2.

Responsibility for Cleanup

A bloodborne spill will be assessed by UNC personnel, Police Department, and/or EHS. A small spill can be cleaned up by trained waste that causes a nuisance condition (foul odor) shall immediately be refrigerated,

2. Appropriate methods for recognizing tasks and other activities that may involve exposure to blood or other potentially infectious materials.

3. Explanation of the use and limitations of methods that will prevent or reduce exposure including engineering controls, work practices, and personal protective equipment (PPE).

Appendix A

Permanent Bio-Hazardous Waste Container Locations

Facility	Location
Butler Hancock	Athletic Training Room
Campus Recreation Center	Front Desk Area (Rm 120)
Gunter Hall	School of Nursing, Laboratory, Rm 1610
Gunter Hall	Speech Language and Audiology Clinic (Rm 1400)
Holmes Dining Hall	Basement 0210
Parsons Hall	Custodial Area