

WAKE FOREST UNIVERSITY

Biohazard Waste Management Plan

Reynolda Campus

WFU

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Questions or concerns regarding this plan should be directed to the Department of Environmental Health and Safety at wfuehs@wfu.edu.

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I. GENERAL INFORMATION

This Plan is intended to provide basic information on the proper handling and disposal of Biohazard material generated at the Reynolda campus and Wake Downtown of Wake Forest University. The Solid Waste Section of the North Carolina Department of Environment Quality (NCDEQ) regulates the packaging, labeling, storage, transportation, treatment and disposal of biohazard waste in North Carolina. Treatment, storage and disposal facilities that accept waste from outside of the facility cannot operate without a permit from the Solid Waste Section.

The Occupational Safety and Health Administration (OSHA) regulate Bloodborne Pathogens and Exposure Control Plans.

Under state regulations a solid waste generator is responsible for the storage, collection and disposal of solid waste. The generator is responsible for ensuring that solid waste is disposed at a site or facility that has all applicable permits required to receive waste.

A. TYPES OF BIOHAZARD WASTE GENERATED

Wake Forest University (WFU) may generate sharps waste; laboratory wastes; waste containing microbiologic specimens; animal parts, tissues, and fluids; waste containing recognizable fluid blood; and other types of biohazard waste as defined in Section .1200 of the NCDEQ Medical Waste Management Rules.

B. BIOHAZARD WASTE GENERATION SITES

Biohazard Waste is generated on a regular basis at several locations, including but not limited to:

Winston Hall – Biology Department

Salem Hall – Chemistry Department

Olin Hall – Physic Department

Reynolds Gym – Health and Exercise Science, Anatomy Lab, Student Health Center

Wake Downtown – Biomedical Sciences and Engineering

In addition, due to the nature of their positions, custodial staff and maintenance staff have the potential to generate Biohazard waste in the course of their work at all buildings on Campus.

C. DEFINITIONS

Biohazard Bag - a disposable red bag which is impervious to moisture and has strength sufficient to preclude ripping, tearing, or bursting under normal conditions of handling. A Biohazard bag shall be constructed of material of sufficient single thickness strength to pass the 165-gram dropped dart impact resistant test as prescribed by Standard D 1709-85 of the American Society for Testing and Materials and certified by the bag manufacturer.

Biohazard Waste – for purposes of this document, Biohazard Waste includes:

Contaminated PPE - any disposable personal protective equipment used during work with Biohazard material.

Medical waste - any solid waste which is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals.

Microbiological waste - cultures and stocks of infectious agents, including but not limited to specimens from medical, pathological, pharmaceutical, research, commercial and industrial laboratories.

Pathological waste - human tissues, organs and body parts; and the carcasses and body parts of all animals that were known to have been exposed to pathogens that are potentially dangerous to humans during research, were used in the production of biologicals or in vivo testing of pharmaceuticals or that died of a known or suspected disease transmissible to humans.

Regulated medical waste - blood and body fluids in individual containers in volumes greater than 20 ml, microbiological waste, and pathological waste that have not been treated pursuant to .1207.

Sharps - includes needles, syringes with attached needles, capillary tubes, slides and cover slips, and scalpel blades.

Blood and body fluids - liquid blood, serum, plasma, other blood products, emulsified human tissue, spinal fluids, and pleural and peritoneal fluids. Dialysates are not blood or body fluids under this definition. Please note that the definition of regulated medical waste specifies blood and body fluids that are in a liquid state and in a container, such as a suction canister. This does not refer to blood absorbed by materials such as bandages and dressings.

Highly communicable disease - diseases, such as those caused by organisms classified by the Federal Centers for Disease Control as Biosafety Level IV organisms, which, in the opinion of the infection control staff, the department, local health officer, attending physician and surgeon, or attending veterinarian merit special precautions to protect staff, patients, and other persons from infection.

Highly communicable diseases - does not include diseases such as the common cold, influenza, or other diseases not representing a significant danger to non-immunocompromised persons.

Infectious agent - a type of microorganism, bacteria, mold, parasite, or virus which normally causes, or significantly contributes to the cause of, increased morbidity or mortality of human beings.

Mixed waste - mixtures of medical and nonmedical waste. Mixed waste is medical waste, except for the following:

(a) Medical waste and hazardous waste is CONSIDERED TO BE hazardous waste and is subject to regulation as specified in the statutes and regulations applicable to hazardous waste.

(b) Medical waste and radioactive waste is CONSIDERED TO BE radioactive waste and is subject to regulation as specified in the statutes and regulations applicable to radioactive waste.

(c) Medical waste, hazardous waste, and radioactive waste is CONSIDERED TO BE radioactive mixed waste and is subject to regulation as specified in the statutes and regulations applicable to hazardous waste and radioactive waste.

Sharps container - a rigid puncture-resistant container which, when sealed, is leak resistant and cannot be reopened without great difficulty.

Storage - the holding of medical wastes at a designated accumulation area.

Tracking document - the medical waste tracking document

Treatment - any method, technique, or process designed to change the biological character or composition of any medical waste so as to eliminate its potential for causing disease.

II. PROCEDURES

A. GENERAL WORK PRACTICES

Prior to working with blood and bodily fluids, employees must have had training with regard to safe handling of bloodborne pathogens and the WFU Bloodborne Pathogen and Exposure Control Plan.

All WFU faculty and staff will follow the WFU Bloodborne Pathogen and Exposure Control Plan in order to minimize potential exposure to bloodborne pathogens.

Universal precautions will be observed by all University employees to prevent contact with blood and other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids will be considered potentially infectious. University employees should treat "commercially available" materials derived from human blood, bodily fluids or tissue as potentially infectious, unless it has been tested and proven negative for Human immunodeficiency virus (HIV) and Hepatitis B virus (HBV).

Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.

Ice Machines used for research may not be used for human consumption, nor may Ice Machines used for human consumption be used for research.

Mixed Waste (see definitions) may not be co-mingled with, or shipped as, Biohazard waste.

Individual Departments and laboratories are responsible for keeping their areas clean and for clean-up and disinfection of any spills or releases occurring in their areas.

i. Wake Forest University Biosafety Committee

No Highly Communicable Disease or Infectious Agent may be brought on Campus prior to review by the Wake Forest University Institutional Biosafety Committee (IBC).

The IBC is charged with evaluating research that is potentially hazardous due to the presence of recombinant DNA, or of certain pathogenic organisms. Investigators must submit a complete protocol of

their research proposals, outlining the methodology in handling the microorganisms employed, predicting the potential hazards, and recommending methods by which communicability of the microbe to humans or to animals can be reduced.

The committee reviews the proposal and either approves the proposal or sends it back to the investigator with recommendations to increase safety. Prior to the outset of research, the committee must endorse the proposal. The Office of Research Development maintains the rules of safety that serve as guidelines for the committee. These cannot be specifically outlined since they vary according to the organism (or DNA) and the potential for airborne, droplet, direct contact, or fomite communicability.

The committee does not deal with proposals involving human subjects in research. Research involving human subjects is governed by the Wake Forest University Institutional Review Board.

Contact the Office of Research and Sponsored Programs for more information:

Research & Sponsored Programs
1834 Wake Forest Rd.
117E Reynolda Hall
Winston-Salem, NC 27106
Phone: 336-758-5888
Fax: 336-758-1959

B. BLOOD AND BODILY FLUIDS

All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

Specimens of blood or other potentially infectious materials shall be placed in a container which prevents leakage during collection, handling, processing, storage, transport, or shipping.

i. Requirements for Blood and Bodily Fluids in Individual Containers in Volumes Greater Than 20mL

Blood and bodily fluids must be stored in a secured area, accessible only to authorized personnel.

Blood and bodily fluids collected for disposal will be stored in a container that is rigid, leak-proof and puncture resistant.

The container must be labeled with the biohazard symbol  and the word "Biohazard."

After collection, blood and bodily fluids must be solidified using commercially available blood absorbent. Absorbed blood and bodily fluid will then be collected in a red Biohazard Bag for disposal.

ii. Requirements for Blood and Body Fluids in Individual Containers in Volumes Equal to or Less Than 20 ml

These containers are commonly vacuum tubes used for taking blood samples. If not stored in a secure area accessible only to authorized personnel, these containers must be packaged in a container suitable for sharps.

C. SHARPS

Sharps should only be used when alternative engineering methods are not feasible.

Great care should be used when employing sharps to minimize the chance of accidental skin puncture.

Whenever possible, engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after implementation of these controls, personal protective equipment shall also be used.

Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed.

Immediately or as soon as possible after use, contaminated sharps shall be placed in appropriate Sharps containers.

An annual review of all sharps will be conducted by the principal investigator (PI) or the owner of the laboratory space to assess current sharp usage and identify engineering controls that would lessen or eliminate the chance of accidental needle sticks.

i. Disposal of Sharps

Sharps must be disposed of in a container that is rigid, leak-proof when in an upright position and puncture resistant.

The container must be labeled with the biohazard symbol  and the words "Sharps" and "Biohazard."

Sharps containers must be:

- Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found.
- Maintained upright throughout use.
- Replaced routinely and not be allowed to overfill.

When moving containers of contaminated sharps from the area of use, the containers shall be closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling and placed in a secondary container if leakage is possible.

ii. Compaction of Sharps

Sharps and Sharps containers may not be compacted.

D. URINE, FECES AND OTHER BODILY FLUIDS

Collected urine and/or feces will be disposed of as Biohazard Waste. Vomit and other bodily fluids will also be disposed of as Biohazard Waste. Soiled diapers are not regulated medical waste and may be disposed as general solid waste.

E. ON-SITE BIOHAZARD WASTE TREATMENT

Microbiological specimens generated at WFU are to be treated on-site in one of the autoclaves located in Salem Hall, Winston Hall or Wake Downtown.

i. Procedures for Microbiological Materials

Potential pathogens and toxic microorganisms such as bacteria, yeast, filamentous fungi, etc., are not required to be disposed of as hazardous waste. Individual laboratories are responsible for destroying all microorganism-related waste they generate.

Follow the procedures below developed by the Biology Department for disposal:

- Prior to beginning a procedure, obtain an unlabeled red plastic Bio-Hazard bag, and one of the Bio-Hazard labels. Attach the label to the bag and use it to collect contaminated solids, spent agar plates, etc.
- If you have not filled the red bag with spent agar plates, disposable pipettes and plastic ware, it may be saved and filled at a later date. Fold down the unused portion and tape it shut.
- Also obtain a large beaker or flask from your own laboratory glassware, place a small Bio-Hazard label on it, and add fresh 10% Sodium hypochlorite solution to 1/10th the total volume. Use this container to collect contaminated liquids such as spent media or liquid cultures.
- As you work, place contaminated liquids into the container with fresh 10% Sodium hypochlorite solution. When you are finished working for the day, the liquid waste should be mixed thoroughly. Add the same amount of fresh 10% Sodium hypochlorite solution as you did at the beginning of the procedure. Allow the waste to stand for at least 20 minutes. After 20 minutes, the liquid can then be flushed down the drain, followed with at least 20 volumes of water.

DO NOT COLLECT LIQUID WASTE FOR MORE THAN ONE DAY; DESTROY IT DAILY.

DO NOT HOLD BAGS CONTAINING THESE SOLID WASTES FOR MORE THAN 7 DAYS; STERILIZE THEM.

ii. Sterilization Process:

To sterilize a red bag, fold down the top portion and tape it loosely with autoclave indicator tape. Place the bag in a shallow tray to catch any leaking media, then autoclave it for at least 20 minutes at 121 degrees C.

After the bags have cooled, THEY MUST BE RELABELED BEFORE DISPOSAL. Obtain a green Non-Hazardous Waste label and one of the large white ATTENTION HOUSEKEEPING labels. Cover the original Bio-hazardous Waste label with the new label. Place the "Housekeeping" label over the upper end of the bag. Sterilized and relabeled red bags can go into general trash.

Instruments and any liquid hazardous biological materials that cannot be soaked or mixed with fresh 10% Sodium hypochlorite solution should be decontaminated by boiling them for 20 minutes, or autoclaving them.

iii. Cleaning / Disinfecting of Anatomy Dissection Tables:

Upon completion of semester when the dissection tables in anatomy have held cadavers the tables will be cleaned and disinfected by an outside contractor.

General housekeeping, cleaning and disinfecting will be conducted by the Department during the semester while the tables are in use.

iv. Calibration of Autoclaves

On a yearly basis the autoclaves used for decontamination of bio-hazardous materials must be checked for correct autoclave temperatures. This is done using a digital thermometer.

The thermometer will be calibrated by placing the probe in boiling water and adjusting the digital read-out to read 100 degrees Centigrade.

The probe, which consists of a thin insulated wire, is wrapped several times at the point and will be placed between the door gasket and autoclave with tape. This creates a seal at the point the probe enters the autoclave when the door is closed and secured. The sensor end of the probe is placed in the center of the autoclave, the door is closed and the autoclave turned to steam. The final temperature is reached when the thermometer read-out does not increase for 10 minutes.

The final temperature and time required to reach equilibrium will be noted in a log kept next to the autoclave.

The Department of Biology is responsible for calibrating the autoclave in Winston Hall. The Department of Chemistry is responsible for calibrating the autoclave in Salem Hall. The lab manager at Wake Downtown will be responsible for calibrating autoclaves at this location.

F. BIOHAZARD WASTE PACKAGING AND STORAGE

i. Packaging Biohazard Waste for Off-Site Treatment

Biohazard Waste must be packaged in a red plastic Biohazard Bag in a rigid fiberboard box or drum in a manner that prevents leakage of the contents.

The outer surface must be labeled with:

- Biohazard symbol;
- the words "INFECTIOUS WASTE" or "MEDICAL WASTE";
- the name, address and phone number of the generator, transporter, storage facility and treatment facility.

Use only the red plastic Biohazard Bags and fiberboard boxes provided by waste vendor.

ii. Storage of Biohazard Waste Prior to Shipment Off-Site for Treatment

All Biohazard waste, including regulated medical waste, must be stored in a manner so as not to create a nuisance either by noxious odors or by encouraging the presence of vermin.

Biohazard waste must be maintained in a non-putrescent state.

Biohazard waste must be stored in a manner that maintains the integrity of the container, including labels and markings.

Areas used to store Biohazard waste must be accessible only to authorized personnel.

Vermin and insects must be controlled.

All floor drains in the storage area must discharge directly to an approved sanitary sewer (sewer or septic system). Ventilation must be provided.

A plan must be maintained at the facility to ensure proper management of Biohazard waste.

III. RECORD RETENTION

All tracking documents, treatment records, and other required documentation will be maintained by the Department that shipped the waste for at least three (3) years.

IV. EMERGENCY ACTIONS

A. ACADEMIC DEPARTMENTS

In the event of a spill, unplanned release, or potential release of Biohazard waste to the environment:

- On Reynolda Campus: Campus Police shall be contacted at extension 5911.
- At Wake Downtown: Sunstate Security shall be contacted at 336-713-1568.

The dispatcher on duty will contact the Environmental, Health and Safety Department by phone, and Environmental, Health and Safety shall take the necessary actions to mitigate or remediate the situation.

Spills of Biohazard materials shall be decontaminated using one of the following methods:

Exposure to hot water of at least 82 degrees Centigrade (180 Fahrenheit) for a minimum of 15 seconds.

Exposure to chemical sanitizer by rinsing with, or immersion in, one of the following for a minimum of three minutes:

Hypochlorite solution (500 ppm available chlorine)

Phenolic solution (500 ppm active agent)

Iodoform solution (100 ppm available iodine)

Quaternary ammonium solution (400 ppm active agent)

Only trained personnel may perform decontamination and disinfection. Personnel performing disinfection procedures shall be equipped with the appropriate personal protective equipment for the situation, but at a minimum shall wear splash eye protection and latex gloves. Protective clothing, shoes, and a face shield may be required for large quantities of Biohazard materials.

B. FACILITIES AND CAMPUS SERVICES

Facilities and Campus Service (F&CS) custodial staff will, at times, be required to clean up spills and unplanned releases of potentially Biohazard material. This would include, but is not limited to, blood, urine and feces. If there is a spill, unplanned release, or potential release of Biohazard material to the environment that does not fall under routine clean up, or is too large a release to be cleaned with normal procedures, call University Police on Reynolda Campus at extension 5911, or Sunstate Security at Wake Downtown at 336-713-1568. The dispatcher on duty will contact the Environmental, Health and Safety Department by phone, and Environmental, Health and Safety shall take the necessary actions to mitigate or remediate the situation.