

TARLETON STATE UNIVERSITY
Biohazardous Waste Program

Office of Risk Management and Safety
August 2009

1. GENERAL

The following information is provided to assist in developing requirements, guidelines and procedures for the safe handling and disposal of hazardous and nonhazardous biological waste for all departments and units of Tarleton State University. In Texas, disposal of biohazardous waste is regulated by the Texas Department of State Health Services (DSHS) and the Texas Commission of Environmental Quality (TCEQ).

2. PURPOSE

The program sets forth recommended minimum biohazardous waste requirements that need to be followed to maximum the safety of all workers.

3. SCOPE

The Biohazardous Waste Program requirements, guidelines and procedures are applicable to all Tarleton State University employees who work with and produce biological wastes.

4. RESPONSIBILITIES

The faculty member or other person with operational responsibility shall ensure compliance with these requirements within his/her area of responsibility. Additionally, the Office of Risk Management and Safety will provide assistance with training as appropriate and monitor program compliance.

5. DEFINITIONS

- a. **Animal Waste** - includes carcasses; body parts; whole blood and blood products, serum, plasma and other blood components; and bedding of animals.
- b. **Biohazardous Waste** - any waste that is infectious or, because of its physical and/or biological nature, may be harmful to humans, animals, plants or the environment. Biohazardous waste includes:
 - i. Animal waste known or suspected of being contaminated with a pathogen
 - ii. Bulk human blood or blood products
 - iii. Microbiological waste
 - iv. Pathological waste
 - v. Infectious waste
 - vi. Waste products of recombinant DNA biotechnology and genetic manipulation
 - vii. Sharps

- c. **Biological Indicator** - Commercial available microorganism (e.g. spore strips or vials of Bacillus species) which can be used to verify the performance of waste treatment equipment and/or processes.
- d. **Bulk Blood and Blood Products** - Discarded bulk (>100 ml.) blood and blood products (higher primate or human) in a free draining, liquid state; body fluids contaminated with visible blood; and materials saturated or dripping with blood.
- e. **Chemical Disinfection** - the use of a chemical agent such as 10% hypochlorite or EPA-approved chemical disinfectant/sterilant (used according to manufacturer's direction) to significantly reduce biological activity of biohazardous material.
- f. **Encapsulation** - is a treatment of waste, especially sharps, using a material such as Plaster of Paris (or a commercial product such as Isolyser) which when fully reacted, will encase the waste in a solid protective matrix. The encapsulating agent must completely fill the container. The container and solidified contents must withstand an applied pressure of 40 psi without disintegration.
- g. **Incineration** – the burning of biological waste in an incinerator as defined in 30 TAC Chapter 101 under conditions in conformance with standards prescribed in 30 TAC Chapter 111 by the Texas Commission of Environmental Quality.
- h. **Infectious Waste** - waste containing pathogens or biologically active material which because of its type, concentration, and quantity is capable of transmitting disease.
- i. **Microbiological Waste** - includes:
 - i. discarded cultures and stocks of infectious agents and associated biological material
 - ii. discarded cultures of specimens from medical, pathological, pharmaceutical, research, and clinical laboratories
 - iii. discarded live and attenuated vaccines
 - iv. discarded disposable culture dishes intentionally exposed to pathogens
 - v. discarded disposable devices use to transfer, inoculate, and mix cultures intentionally exposed to pathogens
- j. **Pathogens** - any diseases that are transmissible to humans.
- k. **Pathological Waste** - materials from human and higher primates and includes, but is not limited to: human materials removed during surgery, labor, delivery, spontaneous abortion, autopsy or biopsy including: body

parts; tissues and fetuses; organs; bulk blood and body fluids; laboratory specimens of blood, tissue or body fluids after completion of laboratory examinations

- l. **Sharps Waste** - Any device having acute rigid corners or edges, or projections capable of cutting or piercing, including: hypodermic needles, syringes, and blades, glass pipets, microscope slides, and broken glass items
- m. **Thermal Treatment** - autoclaving at a temperature of not less than 121°C., and a minimum pressure of 15 psi for at least 30 minutes (longer times may be required depending on the amount of waste, water content and type of container used) subjecting biological material to dry heat of not less than 160°C. under atmospheric pressure for at least two hours. (Exposure begins after the material reaches the specific temperature and does not include lag time.)
- n. **Treatment** - chemical, thermal or mechanical processes that significantly reduce or eliminate the hazardous characteristics, or that reduce the amount of a waste.

6. PROGRAM REQUIREMENTS

The key requirements for disposal of TSU's biohazardous waste are that it must be:

- Segregated from other waste
- Treated to eliminate the biological hazard
- Labeled properly
- Securely packaged or contained
- Disposed of and transported by appropriately trained personnel
- Documented with appropriate records

7. SEGREGATION OF BIOLOGICAL WASTE

Biological waste must not be commingled with chemical waste or other laboratory trash. Hazardous biological waste should be segregated from other waste. Waste that is to be incinerated should not be commingled with glass or plastics.

8. TREATMENT OF BIOHAZARDOUS WASTE

Biohazardous waste must be rendered harmless by appropriate treatment prior to disposal. Waste should be treated as near the point of origination as possible. Treatment methods include: incineration; chemical disinfection; thermal disinfection; encapsulation.

9. LABELING OF BIOHAZARDOUS WASTE

- a. Untreated biohazardous waste must be clearly identified and must be labeled with a Biohazard Symbol.
- b. Treated biohazardous waste intended for disposal at the Transfer Station must be labeled to indicate the method of treatment (this label must cover any biohazard markings).
- c. Label autoclave bags with commercial available autoclave tape that produces the word "AUTOCLAVED" upon adequate thermal treatment. Apply this tape across the Biohazard Symbol on the bag before autoclaving.
- d. All containers of treated sharps must be clearly labeled to indicate the method of treatment used.
- e. There are no record keeping or labeling requirements for nonhazardous biological waste.

10. PACKAGING

Containers must be appropriate for the contents, not leak, be properly labeled, and maintain their integrity if chemical or thermal treatment is use. Containers of biohazardous material should be kept closed.

- a. Sharps - Any waste that could produce laceration or puncture injuries must be disposed of as "SHARPS". Sharps must be segregated from other waste. Metal sharps and broken glass may be commingled with each other, but not with non-sharps waste. Place all sharps in a rigid, puncture resistant container (heavy walled plastic). Must be clearly labeled and delivered to the Health Center. Never attempt to retrieve items from a sharps container.
- b. Broken Glassware - Place in a rigid, puncture resistant container (plastic, heavy cardboard or metal), seal securely and clearly label "BROKEN GLASS".
- c. Solid Biohazardous Waste - Use heavy-duty plastic "BIOHAZARD BAGS" or autoclave bags. Solid biohazardous waste includes: contaminated disposable plastic labware, paper, bedding, etc. (NOT SHARPS).
- d. Nonhazardous Biological Waste - Heavy duty plastic bags or other appropriate containers without a biohazard label are preferred. Red or orange biohazard bags or containers should NOT be used for nonhazardous material.
- e. Liquid wastes should be placed in leak-proof containers able to withstand thermal or chemical treatment. Do not use plastic bags to contain liquids.

11. DISPOSAL METHODS

Treatment of all laboratory biological waste prior to disposal is good laboratory practice, and is highly recommended. Biohazardous waste must be treated, properly labeled and documentation maintained. Personnel with potential for contact with biohazardous material must be appropriately trained. Biohazardous solid waste generated at Tarleton State University is:

- a. Deposited at the Student Health Center (Biohazard Waste Collection Site) and collected monthly by a contracted biowaste transportation company or
- b. Treated by thermal or chemical disinfection or encapsulation (solidification) and then deposited at the University Transfer Station.

Types of biohazardous waste generated include:

- a. Animal Carcasses and Body Parts: not defined as medical waste unless the animals were intentionally infected with a human pathogen. Landfill disposition of uninfected animal parts is acceptable. Avoid conditions that may create visual or odor problems.
- b. Pasteur Pipets and Broken Glassware
 - i. Contaminated with Biohazardous Material:
 - a) Disinfect by thermal or chemical treatment; place in a properly labeled, leak proof and puncture resistant container; place in a TSU dumpster or trash barrel for deposit at the Transfer Station; or,
 - b) Encapsulate in a properly labeled, rigid, puncture resistant container, and place in a TSU dumpster or trash barrel for disposal at the Transfer Station. Container must be clearly labeled to indicate it contains "BROKEN GLASS"
 - ii. Not contaminated with Biohazardous Material:
 - a) Place in a puncture resistant container, then place in a TSU dumpster for deposition at the Transfer Station.
 - b) Container must be clearly labeled to indicate it contains "BROKEN GLASS".
- c. Plastic Waste:
 - i. Contaminated with Biohazardous Material:
Place in a properly labeled, leak proof container, disinfect by thermal or chemical treatment; place in a TSU dumpster or trash barrel for disposal at the Transfer Station.
 - ii. Not contaminated with Biohazardous Material:
Place in a TSU dumpster or trash barrel for disposal at the Transfer Station.
- d. Microbiological Waste:
 - i. Solid - Place in a properly labeled, leak proof container, disinfect by thermal or chemical treatment; place in a TSU dumpster or trash barrel for disposal at the Transfer Station.
 - ii. Liquid - Disinfect by thermal or chemical treatment then discharged into the Sewer System.

NOTE: Excess proteinaceous material can clump and cause drain clogging. Grinding of treated waste may be necessary. Do not grind untreated biohazardous material.

- e. Human Pathological Waste:
Human cadavers, recognizable body parts: must be cremated or buried in accordance with 25 TAC §1.136(a)(4) (relating to Approved Methods of Treatment and Disposition). Other pathological waste from human and higher primates must be incinerated.
- f. Genetic Material:
Disposal of materials containing recombinant DNA or genetically altered organisms must be consistent with applicable NIH Guidelines, in addition to complying with the requirements contained in this document.
- g. Non-Hazardous Biological Waste:
Biological waste that is not infectious or otherwise hazardous to humans, animals, plants or the environment may be discarded as regular municipal waste (solid) or sewage (liquid).
 - i. There are no record keeping or labeling requirements for nonhazardous biological waste.
 - ii. It is good laboratory practice to autoclave or disinfect all microbial products.
 - iii. Avoid conditions that may create visual or odor problems.
 - iv. Do not use Biohazard bags or "red bags" for nonhazardous waste. Nonhazardous bedding (laboratory animal) and agricultural waste such as bedding, manure, etc. should be recycled as compost or fertilizer whenever practical.
- h. Radioactive Waste:
Biological waste that also contains radioactive material must be disposed of properly in accordance with the procedures established by the Office of Risk Management and Safety. Contact RMS for applicable guidance.
- i. Chemical Waste:
Biohazardous waste which also contains hazardous chemicals must be treated to eliminate the biohazard, then managed as hazardous chemical waste through the Office of Risk Management and Safety. Contact RMS for applicable guidance.
- j. Sharps: Discarded sharps (contaminated or not) that may cause puncture or cuts, must be contained and disposed of in a manner that prevents injury to laboratory, custodial and landfill workers. Guidelines for sharps:
 - i. Needles, blades, etc., are considered biohazardous even if they are sterile, capped and in the original container.
 - ii. Needles used for gas chromatography should be thoroughly tripled-rinsed to remove hazardous chemicals before placing in a sharps container.
 - iii. Do NOT attempt to recap, bend, break, or cut discarded needles.
 - iv. Do NOT attempt to retrieve needles from a puncture resistant container.

- v. Never place sharps that are not encapsulated in a trash container or plastic bag that might be handled by custodial staff.
- vi. Encapsulation provides the highest degree of safety possible and eliminates the possibility of needles/syringes used for illegal purposes.
- vii. Proper Sharps Disposal Method:
 - a) Segregate sharps from all other wastes
 - b) Place in properly labeled, leak proof, puncture resistant container
 - c) Disinfect by thermal or chemical treatment
 - d) Deliver containers to Student Health Center for disposal

12. STORAGE OF BIOLOGICAL WASTE

Biohazardous waste should be treated and disposed of promptly and not allowed to accumulate. Containers holding biohazardous material must be clearly labeled with:

- a. Biohazard Symbol for contaminated wastes
- b. Treatment method for non-contaminated wastes

Biological waste may be held temporarily under refrigeration, prior to disposal, in a safe manner that does not create aesthetic (visual or odor) problems. Storage enclosures must be clean and orderly with no access to unauthorized persons (warning signs must be posted).

13. HANDLING AND TRANSPORT

Properly trained laboratory personnel (not custodial) shall be responsible for transporting treated biological waste from the generation site to the dumpster, outside trash barrel or Student Health Center (Biohazard Waste Collection Site). Untreated biohazardous waste shall be handled only by properly trained technical personnel. Please contact RMS for more information about transporting untreated biohazardous waste.

Treated waste must be properly contained and labeled before transport for disposal. Transport of untreated biohazardous materials or foul or visually offensive material through nonlab or populated areas must be avoided. Trash/laundry chutes, compactors, grinders will not be used to transfer or process untreated biohazardous waste.

IMPORTANT NOTE: If you transfer more than 50 lbs per month of biohazardous waste you will officially be subject to an annual reporting program, annual registration fees and strict requirements for transporting (i.e. a leak-proof refrigeration truck dedicated solely to transporting medical wastes, etc.). Please contact the office of Risk Management and Safety to coordinate all transfers of biohazardous waste to the Student Health Center, ext. 9842.

14. TRAINING AND HAZARD COMMUNICATION

Individuals with primary supervisory responsibility must assure that all personnel who work with, or who may contact potentially biohazardous material be informed of the hazards and trained in the proper procedures and equipment needed to avoid exposure, proper disposal, and recognition of symptoms of infection or exposure. Contact the Office of Risk Management and Safety for training assistance.

15. WRITTEN PROCEDURES AND RECORDS

Each biohazardous waste generating entity at TSU is required to maintain written records, which, at a minimum, contain the following information:

- a. Date of treatment
- b. Quantity of waste treated
- c. Method/conditions of treatment
- d. Name (printed) and initials of the person(s) performing the treatment.

If an entity generates more than fifty (50) pounds of biohazardous waste per calendar month, the records must also include:

- a. A written procedure for the operation and testing of any equipment used and a written procedure for the preparation of any chemicals used in treatment.
- b. Processes for which the manufacturer documents compliance with specified performance standards (e.g., temperature, pressure, pH, etc.), and for processes which produce a continuous readout (e.g. strip chart or chart paper), routine parameter monitoring may be used to verify efficacy. Otherwise, biological monitoring is required to document a 99.99% reduction using an appropriate biological indicator (*Bacillus* species) at the following intervals:
 - i. 50-100 pounds per calendar month requires testing once per month
 - ii. 101-200 pounds per calendar month requires testing biweekly
 - iii. more than 200 pounds per calendar month requires testing weekly.
- c. Records must be maintained for at least 3 years for each container of biohazardous waste treated (including sharps).

REFERENCES

Most recent version of Texas Administrative Code for the “Definition, Treatment and Disposition of Special Waste from Health Care Related Facilities”, 25 TAC 1.131-137.

Most recent version of Texas Administrative Code for “Medical Waste Management”, 30 TAC 330.3, 330.1201-1221.

Most recent version of “Centers for Disease Control/National Institutes of Health, Biosafety in Microbiological and Biomedical Laboratories”.