

Chapter 9 - Biohazardous Waste Management

9.1 Scope

While this protocol is included as a part of the Biosafety Manual, it applies to all generator of medical waste as defined by the regulation and this protocol at this university. The applicability is defined by the Arkansas Department of Health (ADH) Rules and Regulations Pertaining to the Management of Medical Waste from Generators and Health Care Related Facilities promulgated under the authority of Ark. Code Ann. § 20-7-109 and Ark. Code Ann. § § 20-32-101 - 112.

9.2 Biohazardous Waste Definition

Medical waste (also known as biohazardous waste or infectious waste) is waste that requires inactivation of the biological material in an approved manner prior to final disposal. It includes the following:

- Pathological waste - all human unfixed tissues, organs and anatomical parts, other than intact skin, which emanate from surgeries, obstetrical procedures, dental procedures, autopsies and laboratories, including embalming waste Such waste shall be exclusive of bulk formaldehyde and other preservative agents.
- Liquid or semi-liquid blood such as human blood, human blood components and/or products made from human blood (e.g., serum, plasma) and other potentially infectious materials, to include regulated human body fluids such as semen, vaginal secretions, cerebrospinal fluid, pleural fluid, pericardial fluid, synovial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids where it is difficult or impossible to differentiate between body fluids, can be discharged into the collection system of a publicly owned treatment works (POTW) within the generating facility. Breast milk, urine, and feces are not considered medical waste and can also be discharged into the (POTW).
- Contaminated items to include dressings, bandages, packing, gauze, sponges, wipes, personal protective equipment, cotton rolls and balls, etc., which cannot be laundered or disinfected and from which blood, blood components, or regulated body fluids drip freely, or that would release blood or regulated body fluids in a liquid or semi-liquid state if compressed or are caked with dried blood or regulated body fluids and all capable of releasing these materials during handling, not to include feminine products, enema bags, used condoms, or diapers.
- Contaminated disposable, single-use gloves such as surgical or examination gloves shall not be washed or decontaminated for reuse and are to be handled as a contaminated item.
- Protective coverings such as plastic wrap and aluminum foil used to cover equipment and environmental surfaces when removed following their contamination are considered a contaminated item.
- All patient care items from hospital isolation rooms and end-stage renal dialysis

units, or from patients with communicable diseases, which cannot be laundered and which are contaminated with regulated body fluids or blood or potential infectious material, must be considered a contaminated item.

- Biological waste and discarded materials contaminated with blood, excretion, exudates, or secretions from isolated animals known, or suspected, to be infected with communicable diseases.

- Microbiological waste which includes, but is not limited to, cells and tissue cultures, culture medium or other solutions and stocks of infectious agents, organ cultures, culture dishes, devices used to transfer, inoculate and mix cultures, paper and cloth that has come in contact with specimens or cultures and discarded live or attenuated vaccines.

- Contaminated sharps which include, but is not limited to, any contaminated object that can penetrate the skin, e.g., hypodermic needles, intravenous tubing with needles attached, syringes with attached needles, razor blades used in surgery, scalpel blades, Pasteur pipettes, capillary tubes, broken glass from laboratories, and dental wires. Potentially breakable container(s) of blood, regulated body fluid, microbiological waste, or infectious material must be treated as contaminated sharps when disposed of. Sharps that have been used in human or animal patient care, treatment or for other medical procedures are included. Any waste produced in the course of physically altering a human being or animal including tattooing, ear piercing, or any other process where a foreign object is used to cut or pierce the skin. All waste generated in this manner meeting the definition of sharps must be handled accordingly.

- Veterinary waste to include any and all animal related waste (carcasses, body parts, bulk blood and blood products, bedding of animals, etc.) which meets the definition of any of the five categories delineated above and has been or is suspected to have been exposed to a zoonotic disease or pathogens known to cause human disease, or which has been exposed to human pathogens in research or the production of biological, must be handled as medical waste. All contaminated sharps and microbiological waste must be handled as medical waste.

- Trace contaminated chemotherapy waste that can be treated as medical/infectious waste. Bulk wastes such as full expired vials of chemotherapy drugs are considered to be chemical waste NOT biological waste and should be managed accordingly. Trace contaminated chemotherapy waste includes: Masks

- Empty drug vials

- Gloves

- Gowns

- IV tubing

- Empty IV bags/bottles and

- Spill clean-up materials.

- Spill/clean-up material collected during or resulting from the clean-up of a spill of regulated medical waste.

- Crime scene/accident/trauma clean-up waste generated by individuals or commercial entities hired to clean crime scenes or accidents that are saturated with human blood, sharps, or sharp objects contaminated with human blood.

- Recombinant DNA. All contaminated liquid, solid, carcasses, and animal wastes from research activities involving RG-2 agents requiring BSL-2 and ABSL-2 containment. All contaminated liquid, solid, carcasses, and animal wastes from research activities involving RG-3 agents requiring BSL-3 and ABSL-3 containment. NOTE: Although RG1-associated DNA is not included in the definition of medical waste; all materials that have been in contact with recombinant DNA must be decontaminated prior to disposal in the sewer or trash. These items are not

subject to the logging requirements described for autoclaves and chemical disinfection but they must still be rendered biologically inactive. This includes recombinant plants.

□ Additional wastes may be added at the discretion of the Institutional Biosafety Committee (IBC) and the EHS director.

9.3 Responsibilities

9.3.1 Principal Investigator or Faculty in Charge of Lab

The principal investigator or faculty in charge of the lab is responsible for:

- Identifying the biohazardous waste generated by their activity
- Segregating biohazardous waste into the appropriate waste stream
- Managing biohazardous waste in accordance with this protocol and
- Providing appropriate training to personnel under their supervision.

9.3.2 Biological Safety Officer (BSO)

The biological safety officer is responsible for:

- Providing training upon request for management of biohazardous waste and □ Inspecting laboratories to ensure compliance with this protocol.

9.3.3 Environmental Health and Safety (EHS)

EHS is responsible for:

- Picking up those biohazardous wastes requiring offsite treatment from laboratories in a timely manner
- Final packaging, manifesting and shipping them for disposal and
- Recordkeeping for wastes shipped off-site in compliance with ADH regulations.

9.4 Disinfection

Arkansas Department of Health requires that any material or surface that comes in contact with an infectious substance must be disinfected prior to reuse. Disinfection is accomplished by appropriate use

of an EPA registered disinfectant used according to the label instructions for the agent being inactivated.

The most familiar disinfectants that are registered with the EPA are bleach (active ingredient sodium

hypochlorite) at a concentration of 10% (1 part household bleach mixed with 9 parts water, hitherto

called 10% bleach), Cavicide, and 70% isopropyl alcohol. However, the disinfectant chosen must be effective against the agent that is being inactivated. If assistance is needed with this, contact EHS.

9.5 Treatment, Storage and Disposal

Arkansas Department of Health requires that biohazardous (medical) waste be treated by chemical disinfection, incineration or steam sterilization before disposal. Arkansas State University requires that

all biohazardous waste be treated with 10% bleach (liquids only), sterilized by autoclave or packaged for

offsite contract incineration.

9.5.1 General Storage and Disposal Methods for Different Types of Waste

□ Disposable sharps are deposited in a sharps container. All disposable sharps waste are treated offsite. Re-usable sharps are safely segregated and contained in leak-proof, rigid, punctureresistant containers while awaiting cleaning, decontamination, and sterilization before re-use.

□ Liquid biohazardous waste is chemically treated with bleach and disposed via sanitary sewer or autoclaved and disposed via sanitary sewer or contained in a biohazard bottle which is placed in a biohazard bin. Biohazard bins are treated offsite by incineration; disposal is by the University's

Infectious Waste Contractor.

☐ Solid biohazardous waste is either autoclaved in a clear autoclave bag lacking the biohazard symbol then disposed of as ordinary trash or placed in a biohazard bin. Biohazard bins are treated offsite by incineration; disposal is by the University's Infectious Waste Contractor. Red or orange bags, or bags marked as biohazard cannot be disposed as ordinary trash, regardless of whether they were autoclaved.

☐ Infectious animal body parts or carcasses are contained in biohazard bags, kept in designated freezers or refrigerators until pickup by EHS. They are placed in a biohazard bin before removal from the lab. Biohazard bins are treated offsite by incineration; disposal is by the University's Infectious Waste Contractor.

9.5.2 Chemical Treatment Standards

☐ Household bleach is 5.5 - 10 % sodium hypochlorite. The appropriate concentration of sodium hypochlorite for disinfecting liquid waste, e.g. supernatants from cell culture, is 5000 ppm, approximately 0.5%. A 1:10 (v/v) dilution of bleach to liquid biological waste is required.

☐ A minimum contact time of sodium hypochlorite with liquid waste is 20 minutes. After 20 minutes of contact, disinfected liquid waste is poured into the sanitary sewer.

☐ Bleach should be stored between 50 and 75°F. Undiluted household bleach has a shelf life of six months to one year from the date of manufacture, after which bleach degrades at a rate of 20% each year until totally degraded to salt and water (exposure to sunlight or additional heat increases the degradation rate substantially).

☐ Any dilution of bleach has a shelf life of 5 days.

9.5.3 Autoclave Standards

All steam sterilizers must:

☐ Use the biological indicator *Bacillus stearothermophilus* placed at the center of a load processed under standard operating conditions to confirm the attainment of adequate sterilization conditions. Indicator organisms must be used monthly at a generator facility in each steam sterilizer;

☐ Record the temperature and time during each complete cycle to ensure the attainment of a temperature of 121 degrees Centigrade (250 degrees Fahrenheit) for 30 minutes or longer (refer to Appendix I of the Biosafety Manual for large quantities) at fifteen (15) pounds pressure, depending on quantity and density of the load, in order to achieve sterilization of the entire load; (Thermometers shall be checked for calibration at least annually.)

☐ Have a gauge that indicates the pressure of each cycle.

☐ Use heat sensitive tape that is lead-free or other device for each container that is processed to indicate that the steam sterilization temperature has been reached. The waste will not be considered appropriately treated if the indicator fails.

☐ Maintain records of the procedures specified in (b) above for a period of not less than three (3) years.

☐ Assure that treatment residues are disposed of in accordance with applicable State and Federal Requirements.

9.5.4 Logging

All wastes that meet the definition of biohazardous waste and are treated chemically or by steam sterilization must be logged before disposal. The date and amount of waste treated and disposed must

be included. A monthly log must be sent to the EHS at the beginning of each month for the previous

month. A template of the log can be obtained by contacting EHS

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