IBRDSC Policy:

Biological Waste Management

Approved: May 29, 2012

PURPOSE:
The purpose of this document is to provide information, requirements, guidelines, and procedures for the handling and disposal of potentially infectious biological waste for all departments and units of the Louisiana State University. Potentially infectious biological waste includes waste potentially infectious to humans, animals, plants, or the environment. It includes, but is not limited, to the following:

- Materials generated by research involving live or attenuated plant or animal pathogenic organisms.
- Materials generated from work involving recombinant DNA.
- Materials from and including toxins of biological origin and infectious agents.
- Materials from and including pathological wastes including tissue, organs, body parts and fluids.
- Materials from humans and primates including blood, blood products, blood collection bags, tubes and vials.
- Sharps (needles, scalpels, razor blades, pipettes) used or unused, generated in health care or laboratory settings.
- Animal carcasses or animal wastes (i.e., feces, bedding).
- Any material which has been mingled with potentially infectious biological waste. Potentially infectious biological waste may be called biohazardous waste, medical waste, biomedical waste, red bag waste, infectious waste, or pathological waste. For simplicity, this document will refer to all such material as "Potentially infectious biological waste".

Attachment A: A listing of Definitions

Attachment B: Biological Waste Procedures for Louisiana State University, School of Veterinary Medicine and Louisiana AgCenter

Attachment C: Stericycle® Packaging Guidelines

The following instructions apply to generators of potentially infectious biological waste.

Training - At LSU, waste generators may be engaged in health care, veterinary work, athletics or research. The waste generator is the Principal Investigator, faculty member, or other person with operational responsibility. Waste generators must assure that all personnel are trained in proper disposal procedures of potentially infectious biological waste. In addition, LSU employees who are reasonably anticipated to come into contact with human or primate blood, tissues, or blood products must adhere to the University Bloodborne Pathogen program. Please contact Pat West with EHS at 225/578-0534 for information on the Bloodborne Pathogen program.

IBRDSC Registration - Laboratories that work with recombinant DNA; pathogens of humans, livestock animals, or plants; or biological toxins must complete a Registration Document for Biohazards or Recombinant DNA Research. This form is available from EHS and must be submitted for review and approval to the Inter-Institutional Biological and Recombinant DNA Safety Committee (IBRDSC).
https://www.lsu.edu/ehs/research-safety/biological-safety/registration-of-biohazard.php

Responsibility - The Principal Investigator, faculty member, or other person with operational responsibility shall assure compliance with these requirements within his or her laboratory or area of responsibility.

Segregation - Potentially infectious biological waste must be segregated in the laboratory. Any wastes that could produce laceration or puncture injuries must be appropriately segregated and disposed of as "SHARPS".

- Keep potentially infectious biological waste separate from radioactive waste. Potentially infectious biological waste that contains radioactive material must be disposed of according to procedures of Radiation Safety. Radiation Safety can be contacted at 225-578-2008 or http://www.radsafety.lsu.edu/.

- Keep potentially infectious biological waste separate from hazardous chemical waste. Potentially infectious biological waste which also contains hazardous chemicals must be treated to eliminate the biohazard, and then managed as hazardous chemical waste through Lisa Pepitone with the EHS Department at 225-252-2169 or https://www.lsu.edu/ehs/environmental/hazardous-waste-disposal.php. Hazardous chemicals must never be sent to the landfill or discharged into the sewer.

Containers and Packaging– Containers must be appropriate for the contents. Containers must not leak. Containers must maintain their integrity if chemical or thermal treatment is used. Containers of potentially infectious biological waste must be closed at all times and prior to and after autoclaving.

- Autoclaved material – There is a separate procedure for containers and packaging for autoclaved material. "Procedures for Decontamination by Autoclaving" is available as a separate policy.

- Sharps (unautoclaved) – Sharps should be placed in rigid, puncture resistant containers. Never bend, recap, or remove needles. Broken or unbroken glass, needles, pipettes, scalpels, razor blades, slides and any sharp objects capable of laceration or puncture injuries are to be placed in Sharps containers. Sharps containers must not be overfilled. Sharps containers are not supplied by LSU or the waste vendor. Sharps containers are to be sealed and placed in red bags containing the biohazardous symbol. Red bags are placed in the boxes containing the biohazardous symbol. Red bags and boxes are provided by the waste vendor.

- Solid Potentially infectious biological waste (unautoclaved)- Should be placed in the red bags containing the biohazardous symbol. Do not overfill red bags. Red bags are placed in cardboard boxes with the biohazardous symbol and sealed. Do not exceed 35 pounds or weight limit as posted on the box. Red bags are closed according to directions printed on the box. Any leaking bags/boxes will be repackaged by the generator. Red bags and boxes are provided by the waste vendor.

- Liquid Potentially infectious biological waste (unautoclaved) - Liquids must not be placed in red bag/boxes. Liquids must be solidified in containers for placement in red bags/vendor boxes. Only <15 ml leak proof containers and vacutainer tubes are eligible for disposal in red bags/vendor boxes. They must be packaged in rigid containers, taped securely, and placed in doubled red bag.

- Attachment C is the Stericycle Packaging Guidelines. Stericycle is the current waste disposal vendor.

Labeling and Marking Requirements – Containers holding potentially infectious biological waste must be clearly labeled, including the biohazard symbol. Generators must provide the following information, on the outside of any box of potentially infectious biological waste – Principal Investigators name, building and room number where the waste was generated. Only indelible or waterproof ink or marker fluid may be used to write this information on the box.

Treatment - Potentially infectious biological waste must be rendered harmless by appropriate treatment. Potentially infectious biological waste at LSU is treated by thermal or chemical disinfection or by incineration. In some circumstances composting, disposal by landfill or digestion can be used. In Louisiana, disposal of potentially infectious biological waste is regulated by the Department of Health and Hospitals, specifically Title 51, Part XXVII of the Louisiana Public Health Sanitary Code. General guidelines are provided in this document. Waste treatment of potentially infectious biological waste should only be performed by trained personnel. Contact Dr. Gregory

Hayes at 225/578-4658 or Dr. Quinesha Morgan at 225/578-4235 for additional information.

- Dry heat treatment – 160 C for 2 hours minimum. Time of exposure begins after attaining the specific temperature and does not include lag time.

- Autoclaving – 121 C at 15 PSI for 30 minutes minimum. Longer times may be required depending on the amount of the waste, the presence of water and the type of container used. A Procedure for Decontamination by Autoclaving is available.

- Chemical Disinfection – For chemical disinfection the appropriate concentration of sodium hypochlorite is a 10% solution. An appropriate contact time is 30 minutes or overnight before disposal into the sewer. Undiluted household bleach has a general shelf life of six months to one year. A 10% bleach solution could degrade within 24 hours. Other EPA approved chemical disinfectants or sterilants may be used according to manufacturer's direction.

- Digestion – A managed anaerobic digestion process in which microorganisms break down biodegradable material in the absence of oxygen.

- Composting – An aerobic digestion process in which microorganisms break down biodegradable material in the presence of oxygen. The "microbial pesticides" in compost may include thermophiles and mesophiles, also detritivores which reduce many pathogens. Thermophilic (high-temperature) composting is well known to destroy many seeds and nearly all types of pathogens (exceptions may include prions).

- Landfill - A landfill site is a site for the disposal of waste materials by burial and is the oldest form of waste treatment. Historically, landfills have been the most common methods of organized waste disposal and remain so in many places around the world.

Disposal methods

- Autoclave - There is a separate procedure for disposal by autoclaving. "Procedures for Decontamination by Autoclaving".

- Solid Animal Waste (BSL1 and BSL-2) – Animal waste, including bedding, that is infectious or potentially infectious can be composted unless it contains infectious rDNA. Infectious rDNA bedding must be incinerated, disinfected by thermal treatment, i.e., autoclaved or tissue digestion. Autoclaved material may then be placed in black trash bags, sealed tightly, and placed in the regular trash.

  Special handling of animal waste is only required for animals utilized for research. The biosafety levels of concern would be BSL 2 and 3 or animals involved in

research utilizing select agents, or research involving radioactive materials and persistent chemicals (over and above routine therapeutic pharmaceuticals). The method of handling feces and other waste (bedding) on research animals is directly related to the type of research being done.

- Medical Waste or waste known to contain infectious diseases organisms must be disposed of in compliance with applicable regulations.

  Following is a summary of the regulations of the Louisiana Department of Health and Hospitals: This agency has regulations governing the packaging, labeling, storage, transportation, and treatment of medical waste, contained in the Louisiana Sanitary Code, Chapter XXVII.

  Definitions and Exclusions - The regulations define several categories- medical waste, infectious biomedical waste, and potentially infectious biomedical waste. The latter is used most extensively throughout the regulations, and is defined, in pertinent part, as follows: "...waste considered likely to be infectious by virtue of what it is or how it may have been generated in the context of health care or health care like activities."

  "Potentially Infectious Biomedical Waste" includes, but is not limited to the following:

  1) Cultures and stocks of infectious agents and associated biologicals, I including cultures from medical and pathological laboratories, from research and industrial laboratories.
  2) Human pathological wastes including tissue, organs, body parts and fluids that are removed during surgery or autopsy.
  3) Human blood, human blood products, blood collection bags, tubes and vials.
  4) Sharps used or generated in health care or laboratory settings.
  5) Bandages, diapers, "blue pads," and other disposable materials if they have covered infected wounds or have been contaminated by patients isolated to protect others from the spread of infectious diseases.
  6) Any other refuse which has been mingled with potentially infectious biomedical waste.

  Eating utensils, animal carcasses and bedding, and "very small quantities" (less than 250 grams or 1/2 pound) of human or animal tissue, clean dressings, and clean surgical wastes from persons or animals not known to be infected, are excluded from the definition of potentially infectious biomedical waste. The last two categories of material must be disposed in tightly closed plastic bags or other impervious containers.

Animal carcasses and tissues and wastes from large animals must be disposed either as potentially infectious biomedical waste, or according to regulations of the Livestock Sanitary Board. Carcasses, tissue, and wastes of pets may be buried, rendered [cooked at a minimum temperature of 250 degrees Fahrenheit for at least thirty (30) minutes], incinerated, or disposed either in accordance with these regulations or on the order of a licensed veterinarian.

Packaging and Labeling - Potentially infectious biomedical waste (i.e., medical waste) must be packaged in a manner that prevents exposure to the material. Liquids must be in a sturdy, leak-resistant container. Sharps must be in a closed, rigid, break-resistant, puncture-resistant container. Plastic bags and other containers must be clearly labeled, impervious to moisture, strong enough to prevent tearing or bursting under normal conditions, and closed prior to transport. A second level of containment is necessary if the material is to be stored prior to transport.

All containers of potentially infectious biomedical waste must be labeled "Potentially Infectious Biomedical Waste," "Medical Waste," or "Infectious Waste." Untreated waste must bear the name and address of the generator or transporter when it leaves the generator's premises. Treated waste that is still recognizable must carry a supplemental label to specify the treatment method used, the date of treatment, and the name or initials of the person responsible for treatment. All labels must be clearly visible and legible, and must be water resistant. Note: There are no requirements in the DHH Regulations that state that the bags, boxes, containers, etc., be a certain color.

Storage and Transport - Potentially infectious medical wastes must be stored in a secure manner. Compactors shall not be used for storage, except for small quantities (defined as a single package containing less than 11 pounds of waste other than sharps or less than 2.2 pounds of sharps), wastes can be transported off the site where they were generated only by transporters permitted by the State Health Officer.

Small quantity generators, including doctors', dentists', and veterinarians' offices and private households, may transport small quantities of properly packaged and labeled wastes to approved large quantity generators, permitted storage facilities, or permitted treatment facilities without meeting the requirements for transport and treatment that large quantity generators must meet.

Transportation of potentially infectious waste (except by small quantity generators, as described above) is governed by Section 27:023 of the regulations. This section contains provisions for transporter permits; written contracts between generators and transporters; vehicles used in

transportation; transporter operation plans (including worker safety and decontamination provisions), and delivery of potentially infectious biomedical waste only to properly permitted facilities.

Treatment and Disposal - Acceptable treatment methods for potentially infectious biomedical waste are set forth in Section 27:025 of the regulations. These include incineration; steam sterilization [generally, autoclaving at least 248 degrees Fahrenheit (120 degrees C.) and a minimum pressure of 15 psi for a minimum of 30 minutes, or longer if necessary]; disposal of liquids into a sanitary sewer system that meets the requirements of Chapter XIII of the Sanitary Code; thermal inactivation [dry heat of at least 320 degrees F. (160 C.) at atmospheric pressure for at least 2 hours, excluding lag time]; chemical disinfection (use of chemical agents that have been approved by the State Health Officer); and irradiation (only with the written approval of the State Health Officer). Sharps must be incinerated, encased in plaster or other approved substances in a tightly closed container, or treated in some other manner that renders them unrecognizable as medical sharps and practically precludes the release of recognizable needles and syringes if compacted. Once treated, potentially infectious biomedical waste may be disposed in a permitted sanitary landfill in accordance with the Solid Waste Regulations of the Department of Environmental Quality. As noted above, treated and still recognizable medical waste must carry a supplemental label specifying the treatment method and date, and the name or initials of the person responsible for treatment.

On-site Storage and Treatment - Generators may store and treat their own potentially infectious biomedical wastes, if they obtain a proper permit and comply with substantive provisions of the regulations as to packaging, labeling, storage, transportation, and treatment.

Enforcement - These regulations are enforced by the Office of Public Health.

- Solid Waste (BSL1 & BSL-2) – All nonsharp potentially infectious biological waste should be disinfected by thermal treatment - autoclave. Autoclaved material should then be placed in black trash bags, sealed tightly, and placed in the regular trash. Large animal bedding except that involving transgenic animals or animals injected with rDNA can be disposed of in a sanitary landfill.

- Liquid Waste (BSL1 and BSL2) – Including bulk blood and blood products, cultures and stocks of etiologic agents and viruses, and cell culture material. Liquid waste may be autoclaved then discharged into the Sewer System. Liquid waste may be disinfected by chemical treatment with 10% bleach then discharged into the Sewer System. Only ≤15 ml leak proof containers and ≤15 ml vacutainer tubes are

eligible for disposal in red bags/vendor boxes. They must be packaged in rigid containers, taped securely, and placed in doubled red bag. Liquid waste may be solidified, taped securely, and placed in doubled red bag. A Procedure for Decontamination by autoclaving is available as a separate LSU policy.

Hypochlorite (Bleach): Contact time: At least 10 minutes. A 10:1 bleach solution/sodium hypochlorite (also called 10% bleach solution) is made by adding nine parts water to one part bleach (sodium hypochlorite). Do not autoclave bleach solutions. A laboratory stock bleach solution is usually 12.5% Sodium Hypochlorite, so a 10:1 solution will result in a final concentration of 1.25%. The diluted solution should be labeled and dated, with an expiration date of 30 days. Note that household bleach is 5.25% Sodium Hypochlorite and can be used in a 10:1 solution, but has an expiration date of one day. To be an effective disinfectant the solution should be at least 0.5% but less than 2%. Remember that even bleach stored in the unopened original container degrades by 20 percent per year, according to the Scripps Research Institute "News & Views."

- Sharps (BSL1) - All potentially infectious biomedical sharps waste will be placed in puncture proof sharps containers, which are placed in red bags and vendor boxes for incineration through the waste vendor.

- Sharps (BSL2) - All potentially infectious biomedical sharps waste should be disinfected by thermal treatment - autoclave. Autoclaved material should then be placed in red bags and vendor boxes for incineration through the waste vendor.

- Radioactive Material - Potentially infectious biological waste that contains radioactive material must be disposed of according to procedures of Radiation Safety.

- Hazardous Chemicals - Potentially infectious biological waste which also contains hazardous chemicals must be treated to eliminate the biohazard, and then managed as hazardous chemical waste through the EHS Department. Specimens in a formalin solution or other chemical solution are treated as hazardous chemical waste. Ethidium bromide and acrylamide items are treated as hazardous chemical waste.

- Animal Carcasses - Incineration through the School of Veterinary Medicine is only for use by SVM necropsy department. Prior approval must be obtained by other departments by contacting the SVM necropsy department. Small animals may be placed in doubled red bags and into vendor boxes for incineration through the waste vendor.

- Biological Toxins – Treat as hazardous waste. Must be packaged in puncture resistant containers, sealed, labeled with hazardous waste label and without biohazard labels.

- Pathological Waste - Is returned to Department of Cell Biology and Anatomy at the LA State University Health Science Center in New Orleans. There is a separate policy for the acquisition and disposal of human body parts

  Bureau of Anatomical Services
  Department of Cell Biology and Anatomy
  Louisiana State University School of Medicine
  1901 Perdido Street
  New Orleans, LA 70112-1393
  Phone: (504) 568-4032

  Problems with disposition of body parts have been the cause of large legal settlements and therefore you must be careful where you obtain human cadaveric specimens and how they are disposed of.

- Genetically engineered organism, plant, or seed - Should be deactivated by thermal treatment - autoclave. Autoclaved material should then be placed in black trash bags, sealed tightly, and placed in the regular trash.

- Prions - Disposal procedures for Prions are specific for the work involved. Please contact Dr. Gregory Hayes at 225/578-4658 or Dr. Quinesha Morgan at 225/578-4235.

- Select Agents – Disposal procedures for Select Agents are specific for the work involved. Please contact Dr. Gregory Hayes at 225/578-4658 or Dr. Quinesha Morgan at 225/578-4235.

- BSL3 Laboratory Waste – Disposal procedures for BSL3 laboratories are specific for the work involved. Please contact Dr. Gregory Hayes at 225/578-4658 or Dr. Quinesha Morgan at 225/578-4235.

- Biological Waste Procedures for Louisiana State University and the School of Veterinary Medicine are included in Attachment B.

Storage – Potentially infectious biological waste should be treated and disposed of promptly and not allowed to accumulate. Outer containers must be stored in a secure area protected from the elements, vandalism, insects and rodents. Unauthorized personnel must be denied access to this designated storage area. When storing containers, be sure that their labels face outward so that they can be easily seen. Containers must be sealed securely to prevent spillage or the leaking of vapors.

Inspection – Periodically, the Louisiana Department of Health and Hospitals inspects compliance at LSU facilities. The health inspector may visit health centers, laboratories, or athletic training areas. It is important to follow all rules and regulations.
The biological waste management program at Louisiana State University is administered by the Office of Environmental, Health, and Safety. It is the responsibility of the

researcher or person with operational authority to properly dispose of any potentially infectious biological waste that is generated as a result of research or departmental operations. These guidelines have been developed as a tool to assist in that responsibility. They address the most common general categories of biological wastes and are not intended to be all inclusive or to supersede any alternate waste management procedures specified in research protocols as approved by the IBRDSC. If you have any questions, please contact Dr. Gregory Hayes at 225/578-4658 or Dr. Quinesha Morgan at 225/578-4235 or Lisa Pepitone 225/252-2169.

Attachment A
Definitions

ATTENUATION - The act of weakening. Also the change in the virulence of a pathogenic microorganism induced by genetic modification passage through another host species, decreasing its virulence for the native host. This is the basis for the development of live vaccines.

AUTOCLAVE - A self-locking apparatus for the sterilization of materials by steam under pressure. The autoclave allows steam to flow around each article placed in the chamber. The vapor penetrates cloth or paper used to package the articles being sterilized. Autoclaving is one of the most effective methods for destruction of all types of microorganisms, including spores. The amount of time and degree of temperature necessary for sterilization depend on the articles to be sterilized and whether they are wrapped or left directly exposed to the steam.

Check IBRDSC Autoclave Validation Policy. Many industries have strict rules about monthly biological indicators on high organic loads and are required to profile generic waste loads such as sharps containers full of pipettes, etc., since many types of materials, such as plastics, do not conduct heat well. Each decon autoclave has a specific cycle time for a certain type of load. Most universities go by state law, or just specify a "safe" time, with overkill built in. Some Universities are required to test decon autoclaves weekly. The Louisiana Sanitary Code, Title 51, Part XXVII. Management of Refuse, Infectious Waste, Medical Waste, and Potentially Infectious Biomedical Waste, Chapter 11, Treatment; states “autoclaving at a temperature of at least 120°C., (248°F.), and a pressure of at least 15 pounds per square inch for at least 30 minutes”.

BIOLOGICALS -Means preparations made from living organisms and their products; includes vaccines and cultures intended to be used for diagnosing, immunizing, or treating humans or animals or in research pertaining thereto.

BIOTOXIN - A poisonous substance that is a specific product of the metabolic activities of a living organism.

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.

CHEMICAL DISINFECTION - Means 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.

DISCHARGE INTO THE SEWER SYSTEM - Means the discharge or flushing of treated biological waste into Sanitary Sewer System followed by copious quantities of water.

GENERATOR - Means any person, by site, whose act or process produces regulated medical waste, or whose act first causes a regulated medical waste to become subject to regulation.

INTER-INSTITUTIONAL BIOLOGICAL AND RECOMBINANT DNA SAFETY COMMITTEE (IBRDSC) - All biological research at LSU/LSU AgCenter is to be conducted using accepted biological safety practices and in full compliance with university policies and all applicable federal rules and regulations relating to such activities. Accordingly, all projects involving recombinant DNA, pathogens of humans, livestock animals, plants, and biological toxins must be registered and reviewed by the IBRDSC.

PATHOLOGICAL WASTE- Pertains to 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 examination.
- Anatomical remains.

PRION: A small proteinaceous infectious disease-causing agent that is believed to be the smallest infectious particle. A prion is neither bacterial nor fungal nor viral and contains no genetic material. Prions have been held responsible for a number of degenerative brain diseases, including mad cow disease, Creutzfeldt-Jakob disease, fatal familial insomnia, kuru, and an unusual form of hereditary dementia known as Gertsmann-Straeussler-Scheinker disease.

RECOMBINANT DNA - Defined as the joining of natural or synthetic DNA segments to DNA molecules that can replicate in a living cell. Recombinant DNA research is the use of recombinant DNA for any purpose.

TRANSGENIC PLANTS AND ANIMALS – Defined as a genetically modified organism (GMO) or genetically engineered organism (GEO). This is a plant or animal whose genetic material has been altered using genetic engineering techniques. These techniques, generally known as recombinant DNA technology, use DNA molecules from different sources, which are combined into one molecule to create a new set of genes. This DNA is then transferred into a plant or animal giving it modified or novel genes. Transgenic organisms, a subset of GMOs, are organisms that have inserted DNA from a different species.

SELECT AGENT OR TOXIN - A microorganism (virus, bacterium, fungus, rickettsia) or toxin listed by HHS that could pose a severe threat to public health and safety. This term also includes:

- Genetically modified microorganisms or genetic elements from organisms listed as select agents, shown to produce or encode for a factor associated with a disease.
- Genetically modified microorganisms or genetic elements that contain nucleic acid sequences coding for any of the toxins listed as a select agent, or their toxic submits.

The Centers for Disease Control and Prevention, Division of Select Agents and Toxins oversees the possession, use and transfer of these organisms/toxins based on the Federal Select Agent Regulation 42 CFR 73, available at http://www.cdc.gov/od/sap/docs/salist.pdf.

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.

THERMAL TREATMENT - (1) autoclaving at a temperature of not less than 121ºC., 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 the type of container used) or (2) subjecting biological material to dry heat of not less than 160ºC., under atmospheric pressure for at least two hours. (Exposure begins after the material reaches the specific temperature and does not include lag time).

The basic principle of steam sterilization, as accomplished in an autoclave, is to expose each item to direct steam contact at the required temperature and pressure for the specified time. Thus, there are four parameters of steam sterilization: steam, pressure, temperature, and time. The ideal steam for sterilization is dry saturated steam and entrained water (dryness fraction ≥97%). Pressure serves as a means to obtain the high temperatures necessary to quickly kill microorganisms. Specific temperatures must be obtained to ensure the microbicidal activity. The two common steam-sterilizing temperatures are 121oC (250oF) and 132oC (270oF). These temperatures (and other high temperatures) must be maintained for a minimal time to kill microorganisms. Recognized minimum exposure periods for sterilization of wrapped healthcare supplies are 30 minutes at 121oC (250oF) in a gravity displacement sterilizer or 4 minutes at 132oC (270oC) in a prevacuum sterilizer (Table7). At constant temperatures, sterilization times vary depending on the type of item (e.g., metal versus rubber, plastic, items with lumens), whether the item is wrapped or unwrapped, and the sterilizer type.

Minimum cycle times for steam sterilization cycles

Type of sterilizer	Item	Exposure time at 250oF	Exposure time at 270oF	Drying time

		(121oC)	(132oC)	
Gravity displacement	Wrapped instruments	30 min	15 min	15-30 min
	Textile packs	30 min	25 min	15 min
	Wrapped utensils	30 min	15 min	15-30 min
Dynamic-air-removal (e.g., prevacuum)	Wrapped instruments		4 min	20-30 min
	Textile packs		4 min	5-20 min
	Wrapped utensils		4 min	20 min

Modified from Association for the Advancement of Medical Instrumentation.

TREATMENT - Refers to chemical, thermal or mechanical processes that significantly reduces or eliminates the hazardous characteristics, or that reduce the amount of a waste.

Attachment B

Disposal Tables

BIOLOGICAL WASTE PROCEDURES FOR LOUISIANA STATE UNIVERSITY

Type of Waste	Safety Level	Proper collection and Labeling in the Lab	Decontamination Method	Disposal After Decontamination
Liquid	BSL1 + BSL2	* Use plastic leak proof labware which can be sealed. * All liquid collection containers must be labeled with the biohazardous symbol. * Glassware may be used if absolutely necessary.	Autoclave following Autoclave Procedure or inactivate with an appropriate amount of disinfectant. Be certain to disinfect the outside of the container.	This may go down the drain.
Liquid (Where autoclaves or deactivation are not available)	BSL1 + BSL2	Solidify or encapsulate liquid.		Place in Vendor Box lined with a red vendor bag.
Solids	BSL1	* Use orange autoclave bags, contained within collection receptacles with lids; lids remain closed	Autoclave following Autoclave Procedure	Place in black trash bags in regular trash.
Solids (Where autoclaves are not available)	BSL1 + BSL2	* Use red bags contained within collection receptacles with lids; lids remain closed.		Place in Vendor Box lined with a red Vendor bag.

		* Both bags and collection receptacles must be labeled with the biohazardous symbol.		
Solids	BSL2	* Use orange autoclave bags contained within collection receptacles with lids; lids remain closed. * Both bags and collection receptacles must be labeled with the biohazardous symbol.	Autoclave following Autoclave Procedure	Place in black trash bags in regular trash.
Sharps	BSL1 + BSL2	Use red, hard plastic Sharps containers with spill proof lids and biohazard label.	Autoclave following Autoclave Procedure	Place in Vendor Box lined with a red Vendor bag.
Sharps (Where autoclaves are not available)	BSL1 + BSL2	Use red, hard plastic Sharps containers with spill proof lids and biohazard label.		Place in Vendor Box lined with a red Vendor bag.

BIOLOGICAL WASTE PROCEDURES FOR LOUISIANA STATE UNIVERSITY SCHOOL OF VETERINARY MEDICINE

Type of Waste	Safety Level	Proper collection and Labeling in the Lab	Decontamination Method	Disposal After Decontamination
Liquid	BSL1 + BSL2	* Use plastic leak proof labware which can be sealed. * All liquid collection containers must be labeled with the biohazardous symbol. * Glassware may be used if absolutely necessary.	Autoclave following Autoclave Procedure or inactivate with an appropriate amount of disinfectant. Disinfect outside of container.	This may go down the drain
***Solids**	BSL1 + BSL2	* Use orange/red autoclave bags contained within collection receptacles with lids; lids remain closed. * Both bags and collection receptacles must be labeled with the biohazardous symbol.	Autoclave following Autoclave Procedure	Place in Vendor Box lined with a red Vendor bag
Sharps	BSL1 + BSL2	Use red, hard plastic Sharps containers with spill proof lids and biohazard label.	Autoclave following Autoclave Procedure	Place in Vendor Box lined with a red Vendor bag.

* Large animal waste (i.e., bedding of horses, cows, etc.) can be collected and disposed of in a sanitary landfill.

Attachment C

Stericycle Packaging Guidelines

Stericycle®

PACKAGING PROCEDURES FOR MEDICAL WASTE DISPOSAL

Using Stericycle Corrugated Containers

STEP 1

SET UP BOX

- Turn over and seal bottom flaps with tape
- Auto-locking boxes, engage bottom flaps

STEP 2

LINE BOX WITH RED BAG

STEP 3

TIE BAG WHEN BOX IS FULL

STEP 4

SEAL TOP OF BOX

- Seal with tape
- Auto-locking boxes, engage top flaps

STEP 5

CHECK MARKINGS

- Federal markings (see picture above)
- Additional state regulations may apply, see Stericycle representative
- Apply bar code label where available

UNACCEPTABLE

Stericycle®

REGULATORY REQUIREMENTS

GENERAL

- Generators are responsible for packaging their wastes.
- Each bag must be hand tied by gathering and twisting the neck of the bag and using a tie or hand knot to secure the bag, and each container must be securely closed.
- Closed bags must not be visible once secondary container is closed.
- Improperly packaged containers or damaged containers will be denied pick-up or returned to the generator.
- Only Regulated Medical Waste can be placed in Stericycle containers.

The information on the poster is based on current federal laws and regulations. Additional state specific regulations may apply. Please be advised that regulations are subject to change.

SHARPS

- Sharp materials ("sharps") must be placed in a puncture-resistant container designed for "sharps" waste. "Sharps" include needles, syringes, broken glass, scalpels, culture slides, culture dishes, broken capillary tubes, broken rigid plastic and exposed ends of dental wires.
- All sharps containers should be properly closed before being placed into secondary containers.
- No loose sharps are permitted outside of sharps containers

For information, contact your Stericycle Sales Representative or Customer Service at (866) 783-7422.

PG Poster CB - 12/06

Stericycle
Protecting People. Reducing Risk.

PACKAGING PROCEDURES FOR MEDICAL WASTE DISPOSAL

Using Stericycle Reusable Containers*

EXAMPLES

STEP 1

LINE CONTAINER WITH RED BAG**

STEP 2

TIE BAG WHEN CONTAINER IS FULL

STEP 3

SECURE LID ON CONTAINER

- Ensure all closure and/or locking mechanisms are engaged

STEP 4

CHECK MARKINGS

- Federal markings (see picture above)
- Additional state regulations may apply, see Stericycle representative
- Apply bar code label where available

UNACCEPTABLE

Not applicable for reusable sharps containers.

*** For large or bulk reusable containers (greater than 119 gallons), bag must meet and be marked per current ASTM requirements, limited to a maximum 46 gallons and 22 lbs.*

REGULATORY REQUIREMENTS

GENERAL

- Generators are responsible for packaging their wastes.
- Each bag must be hand tied by gathering and twisting the neck of the bag and using a tie or hand knot to secure the bag, and each container must be securely closed.
- Closed bags must not be visible once secondary container is closed.
- Improperly packaged containers or damaged containers will be denied pick-up or returned to the generator.
- Only Regulated Medical Waste can be placed in Stericycle containers.

The information on the poster is based on current federal laws and regulations. Additional state specific regulations may apply. Please be advised that regulations are subject to change.

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SHARPS

- Sharp materials ("sharps") must be placed in a puncture-resistant container designed for "sharps" waste. "Sharps" include needles, syringes, broken glass, scalpels, culture slides, culture dishes, broken capillary tubes, broken rigid plastic and exposed ends of dental wires.
- All sharps containers should be properly closed before being placed into secondary containers.
- No loose sharps are permitted outside of sharps containers

For information, contact your Stericycle Sales Representative or Customer Service at (866) 783-7422.

PG Poster CR - 607

PROPER DISPOSAL OF MEDICAL WASTE

Tips for Waste Segregation

ACCEPTABLE PHARMACEUTICAL WASTE

Only non-controlled, non-hazardous waste should be included in the Stericycle Rx Waste Box

95% of medical office pharmaceutical waste

- ✓ **Unused Pills**
- ✓ **Topical Ointments** (in original packaging or zip lock bags)
- ✓ **Partial Vials**

Examples:

- Aspirin, ibuprofen, naproxen
- Multivitamins
- Allergy tablets

ACCEPTABLE REGULATED MEDICAL WASTE

- ✓ **Closed Sharps Disposable Containers**
- ✓ **Visibly Bloody Gloves**
- ✓ **Visibly Bloody Plastic Tubing**
- ✓ **Visibly Contaminated PPE**
- ✓ **Saturated Gauze and Bandages**
- ✓ **Blood Saturated Items**
- ✓ **Blood and Body Fluid**

WASTE FOR SEPARATE DISPOSAL

Hazardous Waste

- ✓ **Any product that is considered by the EPA as ignitable, corrosive, reactive, or toxic**

Examples:

- Live vaccines
- Aerosols and inhalers
- Chemotherapy drugs
- Nitroglycerin products
- Epinephrine, Coumadin, Warfarin
- Nicotine
- Physostigmine
- Phentermine

Not sure if a product is hazardous? Email the complete product name and NDC number to xxxx@stericycle.com

Controlled Substance

- ✓ **Products listed on Schedule II – V of Title 21 United States Code (USC) Controlled Substances Act.**

Examples:

- Opiates (Morphine & Codeine)
- Muscle relaxants
- Depressants
- Stimulants (Amphetamines)

For a complete list, refer to section 1308 of the most recent issue of Title 21 Code of Federal Regulations (CFR) Part 1300 to end (21 CFR § 1308).

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RESOURCE GUIDE

Controlled and Hazardous Pharmaceuticals Require Separate Disposal

Actual container and copy will vary by state

DO NOT TOSS

CONTROLLED

or HAZARDOUS

PHARMACEUTICALS

in your Steri•Safe™ Drug Disposal or Regulated Medical Waste Containers

List of Common CONTROLLED SUBSTANCES

Actiq®	Cocaine® Topical Solution	Duocet®	Levo-Dromoran®	Oralet®	Roxiprin®
Adderall®	Codeine	Duragesic®	Levorphanol	Oramorph SR®	Rubifen®
Alfenta®	Codoxyn®	Duramorph	Librium®	Oxazepam	Secobarbital
Alfentanil	Co-Gesic®	E-Lor®	Lorax®	Oxycet®	Seconal®
Alprazolam	Concerta®	Empirin® with Codeine	Lorazepam	Oxycodone	Serax®
Alzapam®	Dalmane®	Endocet®	Lorcet®	OxyContin®	Soma®
Ambien®	Damason-P®	Epimorph®	Lortab®	OxyFAST®	Stadol®
Anexsia®	Darvocet-N®	Equasym®	Lunesta®	OxyIR®	Statex®
Anodynos-DHC®	Darvon®	Estazolam	Mepergan®	Percocet®	Sublimaze®
Astramorph®	Darvon-N®	Fentanyl	Meperidine	Percodan-Demi®	Temazepam
Ativan®	Daytrana®	Fentanyl®	Metadate®	Propacet®	Tranxene®
Atrenta®	Dexedrine®	Ferndex®	Methadone	Propoxyphene	Triazolam
Azdone®	Demerol®	Fiorinal® with Codeine	Methamphetamine	ProSom®	Tylenol® with Codeine
Benzedrine	Desoxyephedrine	Flunitrazepam	Methylin®	Resoxyn®	Tylox®
Beta-phenyl-isopropylamine	Dexedrine®	Flurazepam	Methylphenidate	Restoril®	Uniserts®
Buprenex®	Dextroamphetamine	Focalin®	Morphine	Ritalin®	Valium®
Buprenorphine	Dextrostat®	Genagesic®	Morphine Sulfate®	Ritalina®	Valrelease®
Butorphanol	Diazepam	Halcion®	MS Contin®	Ritaline®	Vicodin®
Carisoprodol	Diazepam®	Hydrocet®	MSIR®	RMS®	Vicoprofen®
Chlorazepate	Dilaudid®	Hydrocodone	Noctec®	Rohypnol®	Wygesic®
Chlordiazepoxide	Dilaudid-HP®	Hydromorphone	Norcet®	Roxanol®	Xanax®
Choral Hydrate	Dolacet®	Hydrostat IR®	Norco®	Roxanol-SR®	Zetran®
Clonazepam	Dolophine®	Hy-Phen®	Novosecobarb®	Roxicet®	Zydone®
Cocaine	Dover's Powder®	Infumorph®	Opium	Roxicodone®	
	Duadyne DHC®	Klonopin®	Opium Tincture®	Roxilox®	

List of Common HAZARDOUS SUBSTANCES

Material	Typical Use
2-Chloroethyl Vinyl Ether	anesthetics and sedatives manufacture
3-benzyl Chloride	pharmaceutical manufacturing
3-Methylchloranthrene	cancer research
Acetone	solvent in pharmaceutical formulations
Acetyl Chloride	cholesterol testing
Acrylonitrile	pharmaceutical manufacturing
Aniline	pharmaceutical manufacturing
Arsenic	veterinary medicine, severe parasitic diseases
Arsenic Trioxide	chemotherapy
Azaserine	antifungal, antineoplastic
Benzidine dichloride	pathology laboratory
Bromoform	sedative, hypnotic, antitussive
Cacodylic Acid	dermatologic
Carbon Tetrachloride	anthelmintic, pharmaceutical formulations
Chloral Hydrate	cough syrups, sleeping pills
Chlorambucil	chemotherapy
Chlornaphazin	antineoplastic
Chloroform	anesthetic
Chloropropionitrile	pharmaceutical synthesis
Creosote	antiseptic, expectorant
Cresols	antiseptics, disinfectants
Cyanide Salts	laboratory
Cyclophosphamide	chemotherapy
Daunomycin	chemotherapy
Diethylstilbestrol	anticancer agent, contraceptive
Epinephrine	emergency allergy kits, certain types of glaucoma, eye surgery, cardiac arrest
Ethyl Acetate	drug flavoring agent, topical anesthetic
Ethyl Carbamate	antineoplastic
Ethyl Ether	disinfectant, anesthetic
Ethylene Oxide	high level sterilant for surgical instruments
Formaldehyde	antiseptic, disinfectant, preservative
Formic Acid	diuretic, heart and muscle treatment
Hexachloroethane	anthelmintic (anti-worm treatment)
Hexachlorophene	skin treatment
Hexachloropropene	dialysis, pesticide
Lindane	scabicide

Material	Typical Use
Maleic Anyhydride	pharmaceutical manufacture
m-Dichlorobenzene	germicides, pharmaceutical manufacturing
Melphalan	chemotherapy
Mercury	preservatives (thimerosal), antiseptics (mercurochrome), devices (thermometers, sphygmomanometers, others)
Methanol	solvent in pharmaceutical manufacture
Methylcyrilene	antihistamine
Methylthiouracil	thyroid inhibitor
Mitomycin	chemotherapy
Naphthalene	antiseptic, anthelmintic
N-butyl alcohol	bactericide, pharmaceutical manufacture, pain control, anti-hemorrhagic
Nicotine	smoking cessation, nicotine patches, etc.
Nitroglycerin	coronary vasodilator in angina treatment
o-Dichlorobenzene	germicides, pharmaceutical manufacturing
Paraldehyde	sedative, hypnotic
P-Chloro-m-Cresol	antiseptic
p-Dichlorobenzene	germicides, pharmaceutical manufacturing
Phenacetin	analgesic, antipyretic
Phenol	antiseptic, anesthetic, antipruritic (relieves itching)
Phentermine	appetite suppressant
Phenylmercuric acetate	bactericide, pharmaceutic aid in contact lens solutions and nasal sprays
Physotigmine	acholinergenics (liberates/acts like acetylcholine)
Physotigmine Salicylate	acholinergenics (liberates/acts like acetylcholine)†
Potassium Silver Cyanide	bactericide
Reserpine	hypertension, insanity, snakebite, cholera, horse tranquilizer
Resorcinol	acne, dandruff treatment, intermediate in pharmaceutical synthesis
Saccharin	sugar substitute, food preparation
Selenium sulfide	shampoos
Sodium Azide	chemical preservative in hospitals, laboratories
Streptozotocin	chemotherapy
Strychnine	veterinary tonic and stimulant
Tetrachloroethylene	anthelmintic
Thiram	antiseptic
Trichloroethylene	inhalation anesthetic, pharmaceutical manufacture
Uracil mustard	chemotherapy
Warfarin < 0.3%	anticoagulant

Affix this Resource Guide on or nearby your Steri•Safe™ Drug Disposal Container

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REGULATED MEDICAL WASTE ACCEPTANCE POLICY

Stericycle policy requires compliance with all applicable regulations regarding the collection, transportation and treatment of regulated medical waste. Federal Department of Transportation (DOT) Regulations require the generator of regulated medical waste to certify that the packaging and documentation of transported regulated medical waste complies with DOT regulations regarding waste classification, packaging, labeling and shipping documentation. To ensure that neither Stericycle nor the generator of regulated medical waste violates applicable regulations, it is imperative that all parties understand the rules regarding proper identification, classification, segregation and packaging of regulated medical waste. The purpose of this policy is to summarize the minimum requirements for preparing your medical waste for collection, transportation and treatment. Additional facility or state-specific waste acceptance policies may apply based on permit specifications. Please contact your local representative for further information. You may also call (866) 783-7422.

REGULATED MEDICAL WASTE

Stericycle accepts medical waste generated in a broad range of medical, diagnostic, therapeutic and research activities. The term "medical waste" includes biohazardous, biomedical, infectious or regulated medical waste as defined under federal, state or local laws, rules, regulations and guidelines. Except as defined by specific state regulations, this **excludes** RCRA hazardous waste pharmaceuticals, all DEA scheduled drugs including *controlled substances, bulk chemotherapy, waste containing mercury or other heavy metals, batteries of any type, cauterizers, non-infectious dental waste, chemicals such as solvents, reagents, corrosives or ignitable materials classified as hazardous waste under Federal and State EPA Regulations. In addition, Stericycle **cannot accept** bulk liquids, radioactive materials, or complete human remains (including heads, full torsos and fetuses). Stericycle **cannot accept** these excluded materials packaged as regulated medical waste. All lab wastes or materials which contain or have the potential to contain infectious substances arising from those agents listed under 42 CFR 72.3 are strictly prohibited from medical waste by federal law and must be pretreated prior to disposal. Separate protocol and packaging requirements apply for the disposal of non-hazardous pharmaceuticals. Hazardous waste transportation services may be offered in certain geographical locations, under separate contract. Please contact your local representative for details and packaging specifications.

*Un-dispensed from DEA Registrant

WASTE SEGREGATION AND PACKAGING

The generator is solely responsible for properly segregating, packaging and labeling of regulated medical waste. Proper segregation and packaging reduces the potential for accidental release of the contents and exposure to employees and the general public. DOT regulations require (49 CFR 173.197) that all packages of regulated medical waste be prepared for transport in containers meeting the following requirements: 1) rigid; 2) leak resistant; 3) impervious to moisture; 4) of sufficient strength to prevent tearing or bursting under normal conditions of use and handling; 5) sealed to prevent leakage during transport; and 6) puncture resistant for sharps. All regulated medical waste must be accompanied by a properly completed shipping document (See 49 CFR 172.202).

MANAGEMENT OF NON-CONFORMING WASTE

As required by regulation and company policy, Stericycle employees may refuse containers that are non-conforming because of their contents or are improperly packaged, leaking, damaged or likely to create a risk of exposure to employees or the general public. Any non-conforming waste identified in route to or at a Stericycle location may be returned to the generator for proper packaging or disposal. Proper segregation and packaging is essential to ensure compliant and safe handling, collection, transportation and treatment of regulated medical waste.

STERICYCLE REGULATED MEDICAL WASTE ACCEPTANCE POLICY CHECKLIST

ACCEPTED REGULATED MEDICAL WASTE

- Sharps - Means any object contaminated with a pathogen or that may become contaminated with a pathogen through handling or during transportation and also capable of cutting or penetrating skin or a packaging material. Sharps includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires.
- Regulated Medical Waste or Clinical Waste or (Bio) Medical Waste - Means a waste or reusable material derived from the medical treatment of an animal or human, which includes diagnosis and immunization, or from biomedical research, which includes the production and testing of biological products.

ACCEPTED REGULATED MEDICAL WASTE WHICH MUST BE IDENTIFIED AND SEGREGATED FOR INCINERATION

- Trace Chemotherapy Contaminated Waste - RCRA Empty drug vials, syringes and needles, spill kits, IV tubing and bags, contaminated gloves and gowns, and related materials as defined in applicable laws, rules, regulations or guidelines
- Pathological Waste - Human or animal body parts, organs, tissues and surgical specimen (decanted of formaldehyde, formalin or other preservatives as required per hazardous waste rules).
- Non-RCRA Pharmaceuticals - Must be characterized and certified as non-RCRA hazardous material by the generator. **Excludes** all DEA scheduled drugs, including controlled substances*
- **California Only** - Solidified Suction Canisters - Suction canisters that have been injected with solidifier materials to control liquids or suction canisters made of high heat resistant plastics such as polysulfone

REGULATED MEDICAL WASTE NOT ACCEPTED BY STERICYCLE

- Untreated Category A Infectious Substances
- RCRA Hazardous Pharmaceutical Waste and all DEA controlled drugs, including controlled substances*
- Chemicals - Formaldehyde, formalin, acids, alcohol, waste oil, solvents, reagents, fixer developer
- Hazardous Waste - Drums or other containers with a hazard warning symbol, batteries and other heavy metals
- Radioactive Waste - Any container with a radioactivity level that exceeds regulatory or permitted limits; lead-containing materials
- Complete Human Remains (including heads, full torsos, and fetuses)
- Bulk Chemotherapy Waste
- Compressed Gas Cylinders, Canisters, Inhalers and Aerosol Cans
- Any Mercury Containing Material or Devices - Any mercury thermometers, Sphygmomanometers, lab or medical devices
- Mercury-Containing Dental Waste - Non-contact and contact amalgam and products, chairside traps, amalgam sludge or vacuum pump filters, extracted teeth with mercury fillings and empty amalgam capsules

**Consult Stericycle Representative for specific requirements*

Additional waste acceptance policies may apply based on state or permit specific requirements. Hazardous waste transportation services may be offered in certain geographical locations, under separate contract. Please refer to your local Stericycle Representative for additional information and options for possible hazardous waste handling. For additional information on container and labeling requirements contact our Stericycle Customer Service Department at (866) 783-7422.