MEDICAL & BIOHAZARDOUS WASTE MANAGEMENT GUIDE



Guide to the Generation, Storage and Disposal of Regulated
Medical Waste at
Auburn University

Department of Risk Management and Safety Environmental Health & Safety May 2022

A Guide to the Handling and Disposal of Medical Waste



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Introduction

In 1990 the <u>Alabama Department of Environmental Management (ADEM)</u> issued regulations concerning the storage, transportation, treatment and disposal of medical waste. In accordance with these regulations and other national guidelines (<u>BMBL 5th Ed., NIH Guidelines</u>) the <u>Department of Risk Management and Safety (RMS)</u> established a medical waste management program for Auburn University. This guide is intended to serve a general summary of the regulations and provide guidance on the proper management of your medical waste. If you have questions or need additional information for situations not addressed in this guide, please contact this office at 844-4870.

Definitions

Medical waste is defined as the disposal of any human infectious agent or equipment that is capable of transmitting that disease to humans or that poses a substantial hazard to human health or the environment when improperly stored, transported, disposed or otherwise managed. Examples of human disease agents include: Bacterial - Staphylocoocus aureus; Viral - Hepatitis B Virus; and Fungal - Histoplasma capsulatum. Equipment that would be regulated as medical waste includes syringes with or without needles attached and scalpel blades. All medical waste must be either autoclaved and disposed of as solid waste by lab personnel, treated at the University's co-fired combustor or shipped off-site for additional processing to render it non-recognizable.

Biological waste is defined as the disposal of any non-human disease agent or equipment that has come in contact with the non-human disease agent. Examples of biological waste are general zoonotic vectors used in research and cultures used in plant pathology research. The equipment could include petrie dishes and disposal pipettes as long as they do not contain human disease agents. Biological waste is not regulated under the ADEM medical waste requirements. However, national safety guidelines (BMBL 5th Ed and NIH Guidelines) require that all biological waste should be decontaminated prior to disposal. Once biological waste has been decontaminated or autoclaved it can be disposed of as normal trash by lab personnel provided it does not have any wording or symbols indicating that it contains infectious materials. Common decontamination methods include autoclave, bleach, ethanol, and heat sterilization.

Solid Waste includes all other waste and materials which have not been exposed to human infectious agents. Solid wastes are items that may be recycled or disposed in the trash. Chemical and radioactive waste must not be disposed of as solid waste or medical waste.

Radiological Medical Waste is beyond the scope of this guide. Please contact Radiation Safety for more information.

Types of Regulated Medical Waste

Human Blood and Blood Products are classified and managed as medical waste because of the possible presence of infectious agents that cause blood-borne disease. Wastes in this category include bulk blood and blood products as well as smaller quantities of blood samples drawn for testing or research. Waste human blood must be treated by steam sterilization. After sterilization, the liquid portion may be safely poured off into a sanitary sewer drain. Animal blood is not regulated as medical waste unless it has been intentionally exposed to a human infectious agent and is capable of transmitting the disease back to humans. Examples of blood and blood products include components (serum and plasma, for example), and bulk laboratory specimens of blood, tissue, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. Precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine or vomitus unless they contain visible blood. Free-flowing material or items saturated to the point of dripping liquids containing visible blood or blood components would be treated/handled as bulk blood and bulk blood components.

Cultures and Stocks of Infectious Agents (Microbiologicals) waste, regardless of storage method, must be managed as medical waste. Examples of microbiological waste include discarded cultures and stocks of human infectious agents and associated microbiologicals; human and animal cell cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories; waste from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate and mix cultures. Only those animal vaccines which are potentially infectious to humans (Strain 19 Brucellosis Vaccine, Feline Pneumonitis Vaccine, contagious Eczema Vaccine for Sheep, Newcastle Disease Vaccine, Anthrax Spore Vaccine, and Venezuelan Equine Encephalitis Vaccine) shall be considered microbiological waste. Cultures and stocks of animal (zoonotic) disease are not regulated as medical waste if they have been neither intentionally exposed to a human infectious agent nor capable of transmitting that disease to humans. These items are regulated as biological waste and therefore should be decontaminated prior to disposal. (See definition of Biological Waste on the previous page.)

Animal Pathological Wastes are considered to be medical wastes only if the animal has been intentionally exposed to a human infectious agent and it is capable of transmitting the disease back to a human. Animals that are accepted at the University that may be carriers of human infectious agents, e.g., rabies, are not regulated as medical waste. As long as the human disease agent was not deliberately introduced to the animal as part of a treatment or research regimen at the University and the animal is not capable of transferring this disease back to humans it is not regulated as a medical waste, but is biological waste and should be decontaminated prior to disposal.

Sharps are any used or unused discarded article that may cause punctures or cuts and which has been or is intended for use in animal or human medical care, medical research, or in laboratories utilizing microorganisms. Such sharps waste includes, but is not limited to, hypodermic needles, IV tubing with needles attached, scalpel blades, and syringes (*with or without a needle attached*). Items listed above that have been removed from their original sterile containers are included in this definition. Glassware, blood vials, pipettes, and similar items are to be handled as sharps if they are contaminated with blood or body fluids. Sharps that have been exposed to human disease agents should be autoclaved prior to pickup by Risk Management and Safety.

Chemotherapy Waste may not be infectious, and therefore do not normally present risk to the general population, but they are highly toxic and corrosive. If disposed of improperly, these wastes can cause irreparable damage to natural resources. Trace chemotherapy waste usually includes vials, bags, IV tubes and other items that formerly contained chemotherapy drugs, but now qualify as "RCRA empty". A container that used to hold a P-listed substance* is "RCRA empty" only after it is triple-rinsed. A container that used to hold a U-listed substance* is "RCRA empty" when there is less than 3% of the former volume left. If the applicable criteria are met, then this waste can be considered trace chemotherapy waste and can be managed as regulated medical waste and disposed of in yellow containers or in red containers that are prominently marked with the word "chemotherapy". Otherwise, it

should be managed as hazardous chemical waste. **Bulk chemotherapy waste** usually includes items that used to contain chemotherapy agents and that do not qualify as "RCRA empty". Other types of bulk waste include materials used to clean up chemo spills and visibly contaminated personal protective equipment (PPE). Keep in mind that the bags of chemotherapy drugs that were unused but are out of date aren't necessarily hazardous waste. A substance becomes waste when it can no longer be reused, and expired drugs can sometimes be returned to the manufacturer through a "take-back" program or through reverse distributorship.

Surgical Wastes include all materials discarded from surgical procedures which are contaminated with human bulk blood, blood components, or body fluids, including but not limited to, disposable gowns, dressings, sponges, lavage tubes, drainage sets, underpads, and surgical gloves. Discarded surgical material is considered medical waste if it is saturated, having the potential to drip or splash regulated blood or body fluids. Extracted teeth are not included in this definition.

Glassware that has not been exposed to a human disease agent is not regulated as a sharp and should be placed into a container designed for such material and either recycled or disposed of as solid waste. This includes pipettes, capillary tubes, test tubes, stir rods, and other laboratory equipment. All glassware that has been exposed to human infectious agents must be autoclaved prior to disposal. After the glassware has been autoclaved it can be thrown in the dumpster by lab personnel.

Uncontaminated broken glassware should be placed into a container designed for such materials and either recycled or disposed. Currently, there is no locally available market for recycling Pyrex glass so it should be disposed of as solid waste. At a minimum, broken glassware should be disposed of in small double lined cardboard boxes and clearly labeled as broken glassware. Small double lined boxes minimize the potential for injury and excessive accumulation in the laboratory.









Examples of typical broken glassware boxes

Contaminated Equipment includes any equipment not mentioned above which may come into contact with human infectious agents. Equipment that has been contaminated with human disease agents must be treated as a medical waste and either autoclaved or shipped off-site for treatment.

^{*} For more information about listed and characteristic hazardous wastes, see RMS's Chemical Waste Guide.

MEDICAL WASTE CONTAINERS







- 1. SEAL THE BOTTOM OF THE CONTAINER
- 2. LINE THE SIDES WITH YOUR MEDICAL WASTE BAG
- 3. FILL 75% AND SECURE WITH GOOSENECK
- 4. SEAL THE TOP OF THE BOX
- 5. FILL OUT A MEDICAL WASTE INTERNAL MANIFEST (FORM 701)



DISPOSE OF SHARPS IN AN APPROVED AND PUNCTURE RESISTANT CONTAINER ONLY

MEDICAL WASTE EXAMPLES

- ANY Product Soiled with Blood
- Non-liquid Tissue / Body Parts
- Blood and Blood Products
- Microbiological Waste

Body Fluids such as:

- CSÉ
- Semen
- Synovial Fluid
- Lymph
- Amniotic
- Pericardial

DOWNLOAD AUBURN UNIVERSITY

MEDICAL WASTE INTERNAL MANIFEST AT

aub.ie/form701

CONTACT FOR PICKUP

STEVEN NOLEN

334-703-3859 scn0005@auburn.edu

334-844-4870 • auburn.edu/rms • aurms@auburn.edu

Sharps

The sharps container must be red in color and display the International Biohazard Symbol or one of the following phrases:

- * Medical Waste
- * Infectious
- * Infectious Waste
- * Biohazardous
- * Chemotherapy Waste

All sharps must be packaged in an approved sharps container. The <u>Scientific Supply Store</u> in the Science Center Laboratories Building carries a selection of various size sharps containers and they are available from most general scientific supply companies.



Examples of approved sharps containers typically used in laboratory and clinical settings



Examples of trace chemotherapy waste containers

The generator must ensure that the container is properly sealed and marked and labeled. If the container is not properly sealed, or there is any doubt about the integrity of the sharps container it will not be accepted for disposal. Sharps containers should not be used for the disposal of aluminum drink cans, paper, gloves, laboratory glass, culture tubes, bodily fluids or any other similar types of materials. Sharps containers shall not be used for the disposal of chemicals or radioactive materials. **Sharps containers should only be used for sharps.** One exception is broken glassware that is known to have been contaminated with human disease agents. If the sharps have been exposed to human disease agents they must be autoclaved prior to being picked up by Risk Management and Safety.

Disposal

Since sharps must be rendered non-recognizable prior to disposal all sharps are shipped off-site to an approved medical waste treatment facility on a monthly basis. The University's current regulated medical waste disposal vendor is Environmental Biological Services, Inc.

The generator or contact person must complete a medical waste internal manifest prior to the collection of any medical waste. This Internal Manifest Form 701 can be found near the end of this document. When you have a sufficient number of sharp containers to warrant a pickup, you should call the Department of Risk Management and Safety at 844-4870 and request a pickup. Please see the attached "Request for Pickup of Medical Waste Form 700" so that you can provide the appropriate information to RMS. Medical waste will normally be picked up within 3 days of your request. During semester breaks pickup times may be restricted due to reduced waste volume and limited personnel.

Autoclavable Waste

Lab personnel are responsible for transporting autoclaved waste to the trash dumpster located outside of the building. Custodians shall not remove any waste from autoclave rooms.

Packaging

ADEM regulations have specific prohibitions on the disposal of all items bearing either an international biohazard symbol or any wording indicating that the items contain infectious waste, biohazardous waste or medical waste. In order to dispose of treated medical waste as trash the autoclave bag must not be red or orange nor contain any wording or symbols indicating that it contains medical waste. The state prohibits using an orange/red bag for autoclaving and then placing it into a black trash bag for disposal. (ADEM Code 335-17-3-.02)

The <u>Scientific Supply Store</u> has identified a manufacturer of approved blue and clear autoclave bags that meet the ASTM dart test standard. These bags are the similar to those sold by companies such as Fisher and JT Baker. These autoclave bags are available at a lower cost than bags from commercial vendors since the Scientific Supply Store orders them in bulk.

To provide for proper identification of biohazardous materials in the laboratory it is strongly suggested that you acquire outer secondary containers such as a trash receptacle and affix a biohazard symbol on their exterior surface. The blue or clear autoclave bag can then be placed inside the secondary container. This allows the material to be clearly identified in the lab and still allows disposal of the bagged material in the solid waste stream by lab personnel after autoclaving. Most general science catalogs contain a listing for small clear or blue autoclave bags which fit into wire frame holders, if your lab uses small tabletop biohazard bags. If used, these tabletop autoclave bags should be temporarily marked as biohazardous, but the markings must be removed before discarding as normal trash by lab personnel. The Scientific Supply Store also stocks large clear or blue autoclave bags.

Sharps are prohibited from disposal in autoclave bags. If you generate sharps they must be placed into an approved sharps container. Glassware that contains human disease agents should be autoclaved and placed into double lined cardboard boxes for disposal (See Page 5). If no autoclave is

available, glassware contaminated with human disease agents may be placed in approved sharps containers.

Recordkeeping and Testing

Autoclaves used for the treatment of medical waste must be operated in accordance with ADEM medical waste regulations. (ADEM Code 335-17-5-.02)

Steam sterilizers should be equipped to continuously monitor and record temperature and pressure during the entire length of each cycle. Sterilizers not so equipped shall have affixed a temperature sensitive tape to each bag or container of medical waste or obtain approval from ADEM of an equivalent test.

Each bag or container shall be exposed to a minimum temperature of 250 degrees Fahrenheit and at least 15 pounds of pressure for 30 minutes. Processing requirements may be altered if proper decontamination is assured by appropriate testing, and approval is received from ADEM.

Each sterilizer shall be evaluated for effectiveness under full loading by an approved method at least once for each 40 hours of combined operation. (Note: The 40 hour testing requirement is for every 40 hours of operation treating medical waste. Treating non-medical waste does not count toward the 40 hours.) *Bacillus stearothermophilus* is the only biological indicator that can be utilized without ADEM approval.

A written log or other means of documentation as approved by ADEM shall be maintained for each steam sterilization unit and shall contain the following:

- · The date, time (including duration), and operator for each cycle.
- · Approximate weight or volume of medical waste treated during each cycle.
- · The temperature and pressure maintained during each cycle.
- · Method utilized for confirmation of temperature and pressure; and
- · Dates and results of calibration and maintenance.

Owners or operators of steam sterilizers shall not place untreated regulated medical waste in areas or containers designated for pickup and delivery to a solid waste disposal facility.

Sterilizers utilized for waste treatment shall not be utilized for sterilization of equipment, food or other related items. (Note: This only applies to units that are used to sterilize equipment, i.e., syringes, that will be used on humans. Equipment used on animals is not covered under this requirement.)

ADEM requires that units treating medical waste retain the operating log for a minimum of three years.

Please call Mr. Steven Nolen at 334-703-3859 or Mr. Billy Cannon at 334-703-0419 of EHS or the RMS switchboard at 844-4870 to place a pickup request for medical waste. In general medical waste is picked up within 3 working days of your pickup request. However, during semester breaks it may take 5 to 7 days to pick up your medical waste.

LABORATORY WASTE DISPOSAL SIMPLIFIED

Uncontaminated: • gloves • Paper towels • Empty bottles with no chemical residue	Regular Waste:
Uncontaminated: Broken glassware NOTE: Use tongs or a broom and dust pan when handling broken glass	Broken Glass Container
ALL: Needles and syringes Razor blades Pipettes, pipette tips Pasteur pipettes Slides and cover slips Capillary tubes Broken contaminated glassware NOTE: Full containers will not be removed from the lab if contents are over flowing.	Biohazard Sharps Container
ALL: Infectious agents Pathological waste Contaminated paper towels, kimwipes, etc. Cell cultures Plastic fly vials Eppendorph tubes Contaminated personal protective equipment Unbroken vials	Biohazard Box Red Bagged

WASTE DISPOSAL

















Regular Waste-Clear Bag

Biohazardous

- Empty IV bags and Empty medication Blood and all other Waste- Red Bag potentially
- Blood tubing/bags/ infectious material pleurovacs hemovacs/

Empty syringes

vials or containers

without needles

Trash/wrappers

Soaked or dripping bloody dressings

empty bags, bottles

Examples: tubing medication administer chemo used to make and Includes all supplies Trace Chemo:

pads, masks, gowns, vials, syringes, gloves,

wipes etc.



F00d

Diapers Dressings

other potentially Suction liners with infectious material bloody fluid or

bags

Sanitary napkins

Empty foley bags

Stryofoam Gloves

& other drainage

or other potentially dripping with blood All disposable items soaked or infectious materia

Garbage



all unused bulk for proper disposal original pharmacy bag (pourable) Chemo in Return to pharmacy

Yellow Boxes Chemo Waste

- or over the counter cream or patch. liquid, pills, gel medications: IV
- controlled drugs Residual or wasted MUST BE narcotics and or
- RENDERED patches into container or cut UNUSABLE- squirt



expired medications. Unopened/unused or Return to pharmacy

Pharmaceuticals Blue Box

- Partially used or residual prescription
- Acetone
- Eipinephrine orips
- Barium
- proper disposal med in original bag for all unused or residual
- Recovery Act (RCRA) Conservation and

Pharmaceuticals R.C.R.A. *

- Includes unused or RCRA hazardous waste pharmaceuticals are considered
- Inhalers (if empty residual drugs: place in regular
- trash)
- Chemotherapy
- Return to pharmacy
- *Federal Resource

empty Non Chemo vials-Red Box Sharps

- Non-chemo syringes with needles-empty
- Broken medication



Sewer or Sink

- Saline
- Dextrose
- Electrolytes Lactated Ringers
- TPN/Lipids

Courtesy of fem analytika lab



Courtesy of MedPro Disposal



Courtesy of Practice Greenhealth



Courtesy of CalRecycle



Know Where to Throw Lab Waste

Sharps Container



- ALL needles, syringes, blades
- Infectious (or potentially infectious):
- Pipette tips & serological pipettes
- Blood vials





Biohazard Bags

Glass Disposal Boxes



- Infectious (or potentially infectious):
- Culture flasks & dishes
- Centrifuge tubes
- PPE (gloves, disposable gowns, etc.) Specimen bags

Non-Infectious:

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- Pipette tips & serological pipettes
- Glass (broken & unbroken)
- Slides & cover slips
- Empty chemical bottles (triple rinsed)



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AUBURN UNIVERSITY MEDICAL WASTE INTERNAL MANIFEST

--FOR MATERIALS NOT CONTAINING RADIOACTIVE OR HAZARDOUS WASTE PRODUCTS--

Generator			
Department	Room and Building		
Phone	Date		
Total Number of Containers			
Waste Description			
	Estimated Total Weight		
Check one and sign certification:			
Human Disease Agent or Not Autoclaved [
All sharps and other waste materials have been properly packaged according to applicable ADEM regulations. This material does not contain hazardous or radioactive waste that would require additional treatment.			
Non-Human Disease Agent or Autoclaved			
	erly packaged and are not a possible threat to the in hazardous or radioactive waste that would		
Additional Information. Please Print.			
Certification			
I certify that the contents of this consignment the applicable management standards for	ent have been packaged and treated in accordance the type of waste generated.		
Print Name and Date			
Signature			

If you need a new Daily Steam Sterilizer Log form, please contact Risk Management and Safety or use this format to create the form with a spreadsheet or word processing program.

AUBURN UNIVERSITY DAILY STEAM STERILIZER LOG

Department	
Model Number	
Serial Number	

Date	Time	Weight	Temp	Pressure	Duration of Cycle	Operator

If you need a new 40 Hour Steam Sterilizer Log form, please contact Risk Management and Safety or use this format to create the form on a spreadsheet or word processing program.

AUBURN UNIVERSITY 40 HOUR STEAM STERILIZER LOG

Department	
Model Number	
Serial Number _	

Dates of Calibration	Results of Calibration	Method Utilized for Confirmation of Temp and Pressure

SOURCES OF TEMPERATURE SENSITIVE TAPE AND BIOLOGICAL INDICATORS

Thomas Scientific http://thomassci.com

Markson Science, Inc. http://www.markson.com

VWR http://vwrsp.com

Biological Sterilization Monitors (Spore-Strips) Duo -Spore https://www1.fishersci.com

Weber Scientific http://weberscientific.com

Kilit® Ampule

Autoclave Indicator Tapes

Sterility Indicating Tape

BBL Kilit Sterilization Indicator

Pressure- Sensitive Adhesive Sterilizer Indicator Tapes