Yale Environmental Health & Safety

Biomedical Waste Management Guide

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A. INTRODUCTION

You play an important role in Yale's medical waste program if you generate waste in a laboratory or clinical area. This guide will help you dispose of your medical waste in an easy and legal manner.

Our program is designed to protect the people who handle, transport and dispose of your waste. The program is also designed to protect the Environment and minimize Yale's regulatory liability.

Some people believe they can save money by working around this program. These attempts are counter productive. They may place other people and the University at risk. The costs associated with one injury, or violation fines can easily exceed annual operational costs. We would much rather hear and consider your suggestions for program improvement than have you implement unauthorized procedures.

The Environmental Affairs Section is continually working behind the scenes to improve this program and to control its cost. Direct any questions or suggestions to the Environmental Affairs Manager at 432-3219. Call if you have questions about unusual situations or anything not covered in this guide.

Remember: Radioactive or hazardous chemical wastes shall be disposed of through the radioactive waste stream or the hazardous chemical waste stream respectively.

Please note: Clean broken or unbroken graduate cylinders, ehrlenmayer flasks, and beakers can be disposed of through the general trash. Place the items in a cardboard box, seal it, and label it "broken glass".

B. DEFINITION OF MEDICAL WASTE

Medical wastes are defined using the following criteria:

1. Waste Cultures and Stocks of Microorganisms or Etiologic Agents Including:

a) Cultures and stocks of infectious agents or microorganisms from facilities assigned to Biosafety Levels 1 through 3 (BL1, BL2, BL3).
b) Cultures of specimens from medical and pathological laboratories.
c) Disposable containers, materials, and supplies that may have been contaminated during the manipulation of microbial cultures and stocks
d) Wastes from the production of biologicals (including all tissue culture materials.)
e) Live and attenuated vaccines.

2. Human Pathological Wastes

Pathological waste consists of human tissues; organs; body parts; blood; dialysate; cerebrospinal, synovial, pleural, peritoneal, and pericardial fluids; and their respective containers.

3. Waste Human Blood and Blood Products and Their Containers Including:

a) Waste human blood and blood products (e.g. blood plasma, platelets, red or white corpuscles, and other derived licensed products such as interferon, etc.)
b) Items saturated or dripping with human blood or blood products.
c) Items caked with dried human blood or blood products.
d) Intravenous bags.

4. Used Sharps Waste

This category includes used hypodermic needles, syringes (with or without the attached needles), pasteur pipettes, disposable plastic pipettes, scalpel blades, razor blades, blood vials, test tubes, needles with attached tubing, broken plastic culture dishes, unbroken glass culture dishes, and other types of broken and unbroken glassware that was in contact with infectious material including microscope slides and coverslips.

5. Unused Sharps Waste

Unused hypodermic needles, suture needles, syringes, and scalpel blades.

6. Waste Animal Carcasses, Body Parts, and Bedding

Animal wastes purposely infected or known to have been exposed to Class 1, 2 or 3 agents shall be autoclaved. Use the pre-existing disposal system implemented by the Animal Resource Center.

Uninfected or "clean" animals shall be packaged into Stericycle box/bag unit. The box shall be taped shut with a label on the inner bag and on the top of the box. The top of the box must be labeled with a pathological or incinerate only waste sticker. These stickers can be obtained from YARC business office. These boxes are to be left in the YARC coolers for removal by Stericycle.

7. Isolation Wastes

Isolation wastes are defined as biological wastes and discarded materials contaminated with blood, excretion, exudates, or secretions from humans or animals isolated due to infection with Class 4 microbial agents.

If a human or animal is known to be infected with a Class 4 agent, contact the Biological Safety Officer (737-5009) immediately.

C. LOOK ALIKE WASTE

Look alike waste is not considered medical waste. Look alike waste is plastic or glass labware, lab matting and gloves that have not been in contact with infectious material. Look alike waste is disposed of through a separate waste stream and should not be placed in the medical waste stream. Items should be discarded in a manner to prevent physical injury to those people handling the waste. Glass and items that are capable of puncturing bags should be placed in a plastic lined cardboard box. Do not autoclave or chemically decontaminate look alike waste.

All intravascular sharps are considered medical waste regardless of the presence of infectious material and must be discarded in beige sharps containers. Do not discard intravascular sharps in the look alike waste stream.

D. MEDICAL WASTE MANAGEMENT – OVERVIEW SCIENCE / CENTRAL CAMPUS / WEST CAMPUS

All medical waste must be contained in a sealed:

- needlebox sharps container,
- red sharps container
- orange autoclave bag
- clear autoclave bag with no biohazard symbol (for non sharp BL1 waste only)

♦ BL1 material not known to cause disease in healthy adults such as E. Coli K12, Cultures of most non-mammalian tissue or Bl-1 materiesl derived from Recombinant DNA experiments should be collected into distributed green buckets lined with the plain (no biohazard symbol) autoclave bag. Bag must be autoclaved and then can be disposed of through normal trash. All other biological waste must be treated and packaged as medical waste. Please contact your Safety Advisor if you are unsure of your BL classification.

E. DISPOSAL PROCEDURES- SCIENCE/CENTRAL CAMPUS

1. Sanitary Sewer

The sanitary sewer was designed for the disposal of certain liquid wastes. Use of the sanitary sewer reduces the chance for leaks or spills during transport and reduces disposal costs.

♦ Waste microbiological liquid stocks (Class 1,2 and 3 agents) shall be autoclaved or chemically disinfected and poured down the drain whenever possible.

- Human blood and body fluids do not need to be disinfected before being poured down the drain.

- Remember to rinse the sink area afterward. Disinfect if necessary.

2. Needle Sharps Containers

- Discard all intravascular sharps waste such as hypodermic needles, syringes (with/without the attached needles), scalpel blades, and suture needles in your needlebox container.

- You may also deposit any other type of sharps waste into this container.

- Autoclave or chemically decontaminate waste in the container. Place the decontaminated and drained container upright into your box-bag unit.

3. Red Sharps Containers

Do not discard needles, syringes or other intravascular sharps into a designated red plastic container.

- Discard all non-intravascular sharps waste such as: pasteur pipettes, disposable plastic pipettes, blood vials, test tubes, glass culture dishes, microscope slides and overslips, sharp broken plasticware and other types of broken or unbroken glassware that may have been in contact with infectious material.

- Autoclave or chemically decontaminate waste in the container. Place the decontaminated and drained container upright into a box-bag unit.

4. Orange Autoclave Bags

- Place small volume pathological waste, empty intact plastic liquid waste containers (with a residual volume of less than 20 cubic centimeters); intact plastic blood containers (with a residual volume of less than 20 cubic centimeters); intact plastic disposable containers; all other non-sharp materials and supplies that may have been contaminated during the manipulation of microbial cultures and stocks; and non-sharp waste from the production of biologicals (including tissue culture materials) in the orange autoclave bag.

- Autoclave the orange bag before placing it upright in a box-bag unit.

5. Medical Waste Box-Bag Unit

- All needlebox sharps containers, red sharps containers and orange autoclave bags must be placed in a Stereicycle box-bag unit when full. The Stericyle box-bag unit consists of the cardboard medical waste box and the intact red bag liner. Place all sharps containers and bags upright in the box-bag unit. This will help minimize leaks and spills during transport.

- ♦ Seal the inner red bag liner when the box-bag unit is full. Fill out and place on the top of the bag, the black and white 3x5 inch biomedical waste generator label. These labels can be found in the KBT stockroom. Tape box shut and place another black and white label on the top of the box.

- ♦ Keep your box-bag units inside your laboratory. Compliance with fire codes and maintaining control of this special waste stream is very important. The weight of the box can not exceed 50 lbs or it will not be removed. It will have to be repackaged and called back in for removal.

- ♦ A third party vendor removes box-bag units from the Science Hill buildings. At the same time, they will deliver an equal number of empty box bag units so you have a continuous supply.

- ♦ Needleboxes and red sharps containers, autoclave bags and box-bag units shall only be used for medical waste disposal.

F. MEDICAL WASTE MANAGEMENT – OVERVIEW MEDICAL SCHOOL CAMPUS

All medical waste must be contained in a sealed:

- needlebox sharps container,
- red sharps container
- orange autoclave bag
- small cardboard box/bag unit (for disposal in aluminium carts)

- ♦ **Low Risk Waste**

  - Low risk waste has been contaminated with Biosafety Level 1 biological material not known to cause diseases in healthy humans, animals or plants. This category includes Biosafety Level 1 materials such as E.coli K12, cultures of most non-human, mammalian and non-mammalian tissue and other BL1 derived materials. In addition, human and non-human primate blood, body fluids, cells, cell lines, and tissue cultures (which are Biosafety Level 2) will be included in this low-risk waste category.

    Low risk waste should be collected into the small cardboard box/bag units. When full, tape bag closed and close box. Write lab and PI on the side of the box with a marker and place box upright into the aluminium collection cart. Autoclaving is not required.

    Low risk waste that meets the definition of an intravascular sharp must be collected into a needlebox. Once full, lock the needlebox closed and place directly into the aluminum cart.

- **Moderate to high risk waste**

  - Moderate to high risk waste has been contaminated with human, animal, or plant pathogens, non-exempt recombinant DNA, select agents or biological toxins. Examples include BL2 or BL3 human or animal pathogens, BL2 or BL3 non-exempt recombinant DNA, agents requiring State, CDC, or USDA registration.

    Moderate to high risk waste must be collected into a red waste container or needlebox. This waste requires autoclaving by the laboratory. All BL3 waste must be then placed into a cardboard Stericycle box bag unit and labeled and sealed. All non BL3 waste in this category is then placed into the aluminum cart after autoclaving.

- **Small cardboard box bag units**

  - All items that are sutible for disposal into a red plastic container can be collected in the cardboard box bag units. Do not confuse these boxes with the larger overpack Stericycle box bag units.

- **Aluminum Cart system**

  - The carts are used to collect the medical waste generated at the medical school. Chemically contaminated or pathological or chemotherapy waste can not be put in to the carts. This waste must be packaged into a cardboard Stericycle box bag unit and labeled as pathological or chemotherapy waste.

  - The carts and then transported back the the autoclave/shredder system located at the dock at 200 South Frontage road. The carts are autoclaved and the contents are then shredded to render the waste unrecognizable.

G. ORDERING PROCEDURES- For Entire Campus

- Extra Stericycle box-bag units can be obtained from Environmental Affairs at no cost to your laboratory. Visit EHS's Integrator site for ordering containers, boxes and requesting removal of full, sealed Stericycle boxes.
  https://secure.its.yale.edu/cas/login?service=https://ehsis.yale.edu/EHSIntegrator

- Needleboxes can be obtained through the KBT, Medical School or Chemistry Stockrooms free of charge. Red sharps containers needed for waste requiring autoclaving by the labs, can be ordered through Environmental Affairs through the EHS Integrator system.

- Orange autoclave bags may be purchased at either the Medical School stockroom or Kline Biology Tower stockroom.

- Clear autoclave bags for for BL-1 waste at Science Hill campus can be obtained through the KBT stockroom.

- Cardboard box units for collection of waste through aluminum cart system can be found at any autoclave location that stores a cart.

H. DISPOSAL PROCEDURES FOR LIQUIDS

1. Sanitary Sewer

- The sanitary sewer was designed for the disposal of certain liquid wastes. Use of the sanitary sewer reduces the chance for leaks or spills during transport and reduces disposal costs.

- Waste microbiological liquid stocks (Class 1,2 and 3 agents) shall be autoclaved or chemically disinfected and poured down the drain whenever possible.

- Human blood and body fluids do not need to be disinfected before being poured down the drain.

- Remember to rinse the sink area afterward. Disinfect if necessary.

H. MIXED WASTE

1. Chemical Waste and Medical Waste

Items contaminated with ethidium bromide, diaminobenzidine (DAB), phorbol, or phenol-chloroform mixtures should not be mixed with other medical waste. Segregate these items into a beige sharps container, red sharps container or orange autoclave bag and label accordingly. When the container is full, place it directly into a box-bag unit. Do not autoclave or bleach decontaminate. ***Label box-bag unit with pathological waste sticker.***

2. Chemotherapy Waste and Medical Waste

Items contaminated with trace amounts of a chemotherapeutic agent or empty stock bottles may be disposed of through the medical waste stream. "Empty" is defined as containing less than 3% by weight of the total capacity of the container.

Stock solutions of these chemicals and items that are heavily contaminated are disposed of through the Chemical Hazardous Waste Program.

Call the Environmental Affairs Section (432-6545) for guidelines concerning the disposal of chemical hazardous waste.

3. Radioactive Waste and Medical Waste

Radioactive sharps waste should be disposed of in the radioactive labeled sharps containers provided by the Environmental Affairs Section.

Animal carcasses, tissue/parts, and excreta containing/contaminated with radioactive materials shall be disposed of according to Environmental Affairs Section requirements.

4. Other Mixed Waste Issues

If you have any questions regarding other mixed waste issues please call the Environmental Affairs Section (432-6545).

I. BIOLOGICAL DECONTAMINATION OPTIONS

CHEMICAL DECONTAMINATION: Sharps contaminated with ethidium bromide, diaminobenzidene (DAB), phorbol or phenol-chloroform mixtures are already chemically decontaminated. Segregate these sharps into one container and label accordingly. Do not autoclave or bleach. This waste must be packaged into a Stericycle box bag unit and labeled as pathological waste.

BLEACH DECONTAMINATION: Fill the container with a 1: 10 dilution of bleach, close the lid, and allow to stand overnight. Invert the container in a sink and drain off the bleach solution.

AUTOCLAVING IS PREFERRED: (Hazardous chemicals shall not be autoclaved). With the cover partially open, autoclave the container at 250°F and 15 pounds per square inch of pressure for 60 minutes.