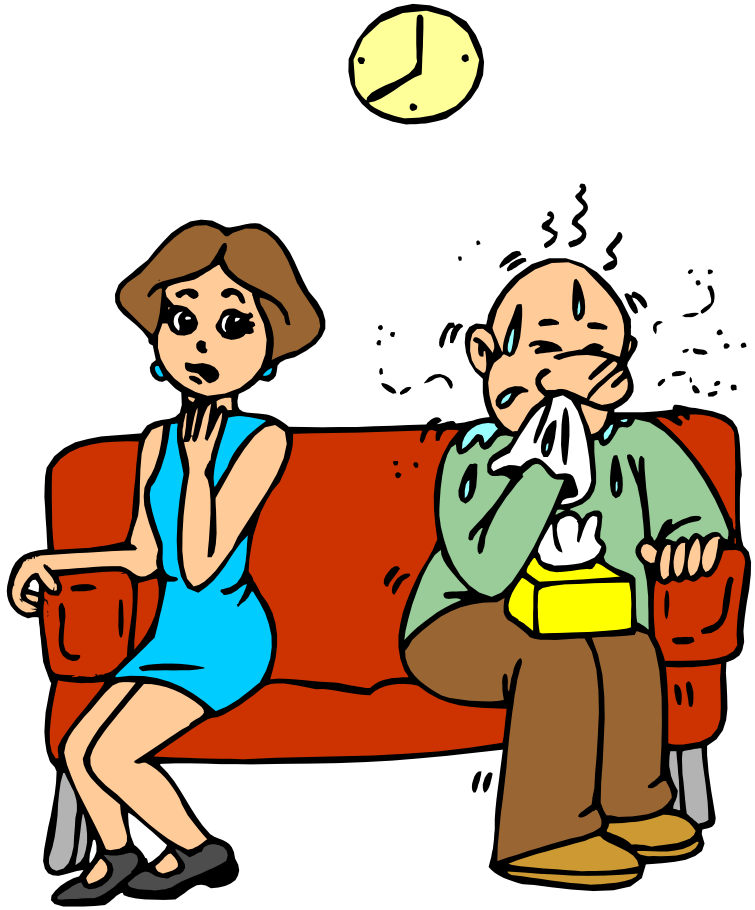
Waste Management

In the Laboratory Setting

Assoc. Prof. Dr. Ilker BUYUK

Definition of Biohazardous Waste

- Biohazardous waste is that waste that is capable of producing an infectious disease in humans and includes at a minimum blood, body fluids, discarded sharps, inoculated culture media, tissues and slides.
- Biohazardous waste includes the following categories:
- Blood and body fluids
- Infectious Sharps waste
- Laboratory waste
- Medical sharps
- Some isolation waste
- Some animal waste



Blood and Body Fluids Includes:

- Blood/Blood Products
- Serum,
- Plasma
- Other blood components
- Body Fluids
- Semen
- Vaginal secretions
- Cerebrospinal fluid
- Pleural fluid
- Peritoneal fluid
- Pericardial fluid
- Amniotic fluid
- Any other body fluid visibly contaminated with blood
- Does NOT Include
- Urine, unless visible blood is present
- Feces, unless visible blood is present
- Vomit, unless visible blood is present

Blood and Body Fluids

- In order for blood and body fluids to be considered biohazardous, they must also be present in **pourable, dripable amounts**.
- A pourable quantity is defined as the ability of a liquid or semi-liquid form to drip or flow. Items caked with dried blood or other body fluids and are capable of releasing these materials during handling are considered biohazardous as well. If you can squeeze an item and squeeze blood or body fluids out of it, or if once the items is dry, you can pull it taught and small flecks of dried blood or bloody fluids can flake off of it, it is considered to be biohazardous.

Examples of Biohazardous vs. Non-biohazardous Waste

What's Biohazardous:

Bottles of blood or body fluids are considered biohazardous. This fluid is probably pleural fluid.

Examples of Biohazardous vs. Non-biohazardous Waste

What's Biohazardous:

This lab waste is considered biohazardous.

In lab situations, where employees are working with concentrated organisms, culture plates, gloves used to handle them and towels that they sat on are all considered to be biohazardous.

In non-laboratory situations, gloves are considered biohazardous only if they have blood on them and towels are biohazardous only if they have blood or body fluids on them that is in pourable/dripable amounts.

Examples of Biohazardous vs. Non-biohazardous Waste

What's Non-biohazardous:

Unused suction canisters, unused dressing materials and dry paper products are not considered biohazardous waste.

The blood on this towel is not considered biohazardous. The blood is well contained within the fibers of the towel, and will not fleck off if the towel is pulled taught.

Other Inappropriate Waste

This red container was returned by the waste vendor, because it contains an aerosol can. Biohazardous waste undergoes both heat and pressure as part of the process that renders biohazardous waste non-infectious. Aerosol cans, even if empty, can act as a small bomb if placed under these conditions, creating a very unsafe condition for employees handling this waste. Aerosol cans must NEVER go in biohazardous waste. Aerosol cans are required by law to be recycled on our campus.

Contaminated Equipment and Linen

- Equipment and linen contaminated with infectious material or biological agents must be handled and decontaminated in accordance with the guidelines established in the University Exposure Control Policy.

Equipment and Linen

- Equipment and Linen ARE NOT Thrown Away as a Biohazard!
- Linen saturated with blood and/or other body fluids should be contained by wrapping it with other used linen and placed with other dirty laundry. Most of the laundry vendors are capable of removing many stains that might seem impossible to clean out of linen. Once it has gone through the cleaning process, appropriate personnel will determine if an item must be discarded due to contamination.

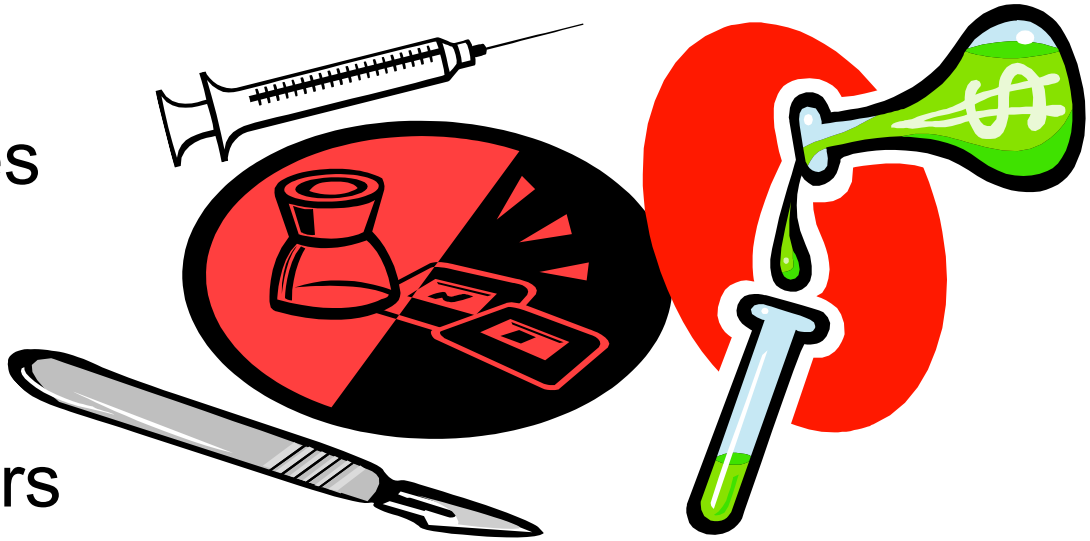
Equipment contaminated with blood or body fluids is to be wiped off with a low level disinfectant. If blood or body fluids have leaked into the machinery, place a biohazard label on the piece equipment and indicate on the label where you think blood or body fluids have leaked into the mechanism. Call University Administration to have the equipment serviced.

Infectious Sharps Waste

- All discarded items derived from human patient diagnosis, care or treatment, or items from animals infected with zoonotic disease in medical or research facilities which could potentially transmit disease via direct subdermal (beneath the skin) inoculation are considered to be biohazardous.

Infectious Sharps Waste

- Infectious Sharps Waste includes the following items that have been contaminated with infectious materials:
- Hypodermic needles
- Scalpels
- Pipettes
- Breakable containers
- Glass products (i.e., slides or cover skips)



Pipettes are of special concern in the research areas

Pipettes made of rigid plastic can break during transport, creating a “sharp” and/or pierce through plastic liners, creating a hazard for employees handling the waste. For this reason, all pipettes made of rigid plastic must be disposed of in approved sharps containers.

Medical Sharps

- Medical sharps waste includes needles and syringes used in patient care and have become contaminated with blood or body fluids. *Needles and syringes NOT used in patient care and do not have blood or body fluids on them are also considered biohazardous waste as there are safety concerns regarding their disposal.*

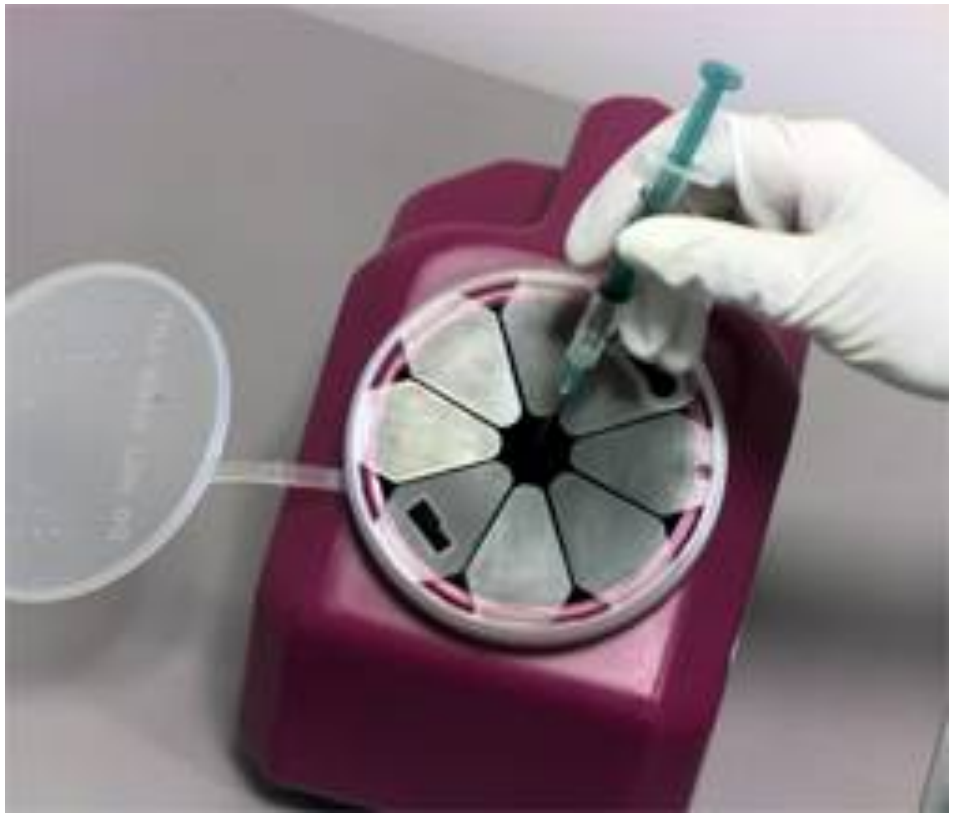
While it may sound contradictory to dispose of suction canisters, needles and syringes that are used but not contaminated with blood or body fluids, it is a necessary safety precaution for those individuals handling such items further down the waste stream. Environmental Services personnel or other waste handlers who sustain injury while handling such waste will look in the waste bag to identify what may have caused their injury. If a leaking suction canister, needle or syringe is visible, the worker will assume that they had a blood/body fluid exposure, and will need to go through post exposure prophylaxis treatment. ***Handling all suction canisters, needles and syringes as though they are a biohazard can help prevent unnecessary concern and treatment from these types of "exposures".***

Sharps Waste

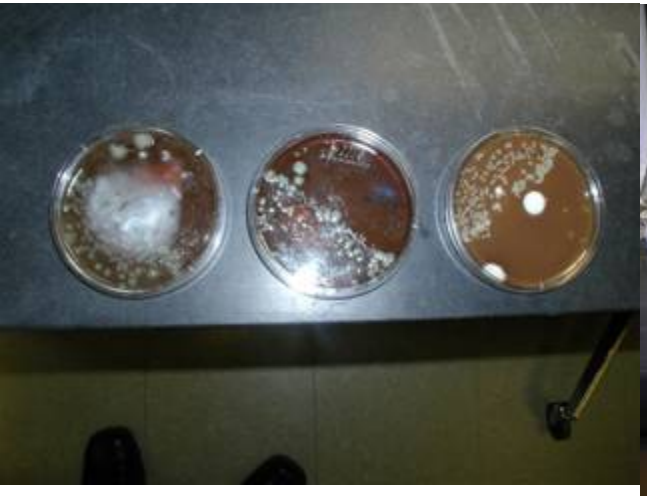
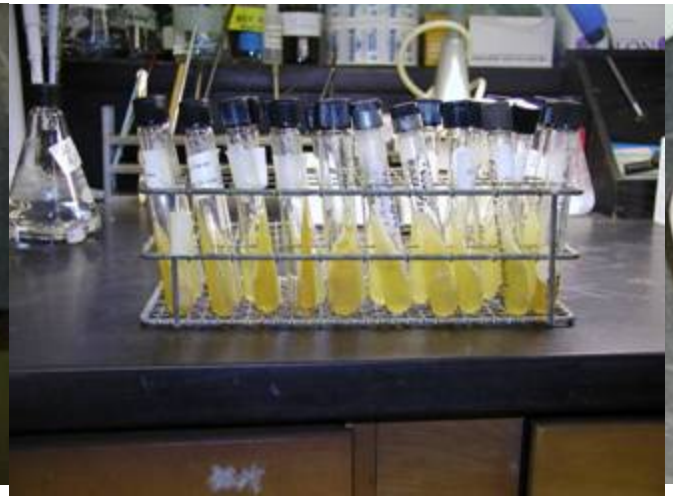
All sharps containers must meet campus Safety Office stands (i.e., leak-proof, puncture resistant, etc.) If there is any question as to whether or not a sharps container meets acceptable standards, contact the Safety Office, and an officer will examine the container to assure that it meets minimal safety standards.

Containers must be sealed when they are approximately ¾ full and placed with the biohazardous waste for pick up and disposal. *NEVER place sharps in a sharps container once it is beyond ¾ full, as there is a good chance that the sharp may bounce out of the container and cause injury*.

Sharps containers should be bagged and sealed as outlined above if they contain liquids in the form of blood, bloody fluids or medications. Bagging sharps containers appropriately when they contain liquid biohazardous substances helps to contain these fluids in the event that the container should tip over during handling, storage or transport.



Laboratory Waste


Laboratory waste includes all cultures and stocks of infectious agents, including specimen cultures from medical and pathological laboratories. It also includes wastes from the production of biologicals, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate and mix cultures.

Animal Waste

Animal waste is derived from animals afflicted with zoonotic disease, or purposefully infected with agents infective to humans. Infectious animals waste includes:

Blood and body fluids

Carcasses

Body parts

Bedding of animals that were infected with a disease communicable to humans

Handling of Biohazardous Waste

- Infectious waste, except for sharps, shall be contained in disposable plastic bags or containers that are tear-resistant, leak-proof, and secured to prevent leakage or expulsion of solid or liquid waste during storage, handling or transport.
- *Department of Transportation (DOT)* regulates shipping of biohazardous waste. DOT requires that all biohazardous waste containers have their inner bag tied at the top in a single knot and the lid securely closed prior to transport. ANY facility not complying with these requirements is subject to heavy fines by DOT.

PROPER HANDLING OF BIOHAZARDOUS WASTE

1. Only Biohazardous Waste should be placed in these containers - items contaminated with pourable/dripable or dried, crusted blood or body fluids, sharps (in sharps containers), etc.

2. Waste must be placed in a red bag in the tub to comply with DOT regs. Gather bag together keeping the air in bag to a minimum. Do not push down on the bag or puncture it to remove air.

PROPER HANDLING OF BIOHAZARDOUS WASTE

3. Twist bag into single braid.

4. Use the braid to tie single knot.

“Bunny Ear” Ties do not meet the DOT requirements and could result in a fine.

PROPER HANDLING OF BIOHAZARDOUS WASTE

5. Tighten knot by placing one hand above the knot and pulling on the top of the braid while push down on the knot. Carefully tuck the knot and bag into the container.

6. Place lid on container and snap it into place.

Container should be placed at the designated pickup location.

Bag Tying



The above pictures are examples of inappropriately tied bags. Bags can not be left open, tied into dog-ears, or taped/twist-tied closed. The only way to secure bags that is acceptable to DOT is tying the bag at the top in a single knot.

Inappropriately Packaged Waste

- This waste was packaged inappropriately. Once the bag is tied, the lid must be placed securely on the container.

Preparation for Transport

Prior to transport off campus, all infectious waste shall be placed in rigid or semi-rigid, leak-proof containers such as disposable or reusable pails, cartons, boxes, drums or portable bins. These containers may come in different shapes and sizes, but all must meet DOT criteria to be used for biohazardous waste transport. The 28-gallon biohazardous waste containers have a 50 pound weight limit. Animal caresses must be placed in the larger (taller) red biohazardous waste containers as the contents have a tendency to expand under certain conditions.

Biohazardous Waste Containers

Biohazardous waste containers shall be clearly marked with the universal biohazard symbol prominently displayed or labeled “biohazardous waste” and sealed.

Inappropriate Packaging of Containers

These two plastic bottles filled with used syringes were found in one of the biohazardous waste areas. It is unlawful in the city of Lansing to dispose of needles and syringes in such a manner; disposing of these items as they were found on the dock is in violation of DOT regulations on the MSU Medical Center campus. Any containers such as these must be placed in an approved large sharps container and then placed in the designated biohazardous waste area for pick up.

Inappropriate Packaging of Containers

This container was refused by our biohazardous waste vendor because the container did not meet DOT transport regulations. Taping the top of the container allows for sharps or blood and bloody fluids to leak around the weave of the tape, if the container should tip over. Large biohazardous waste and chemo waste containers such as these must be sealed with a tightly fitting lid prior to transport.

Transporting Biohazardous Waste

- Biohazardous waste must be transported in separate trailers or carts designed for biohazardous waste.

Biohazardous Waste Treatment

- All red bag biohazardous waste must be rendered “non-infectious” using a method approved by the state. In the state of Michigan, autoclaving is considered an appropriate means of rendering waste “Non-infectious”.
- Biohazardous waste shipped off campus for treatment must be properly packaged and transported to an approved treatment facility. All waste collected by our waste vendor is taken to their processing plant, where it is autoclaved and then dumped in the landfill with regular waste.

Proper Segregation of Recyclable Waste

The Red, White and Blue Campaign

The Biohazardous Waste Committee has created an educational program focusing on the three largest waste streams generated on The MSU Medical Center campus called the Red, White and Blue Campaign:

Red = biohazardous waste

White = general waste

Blue = recyclable waste

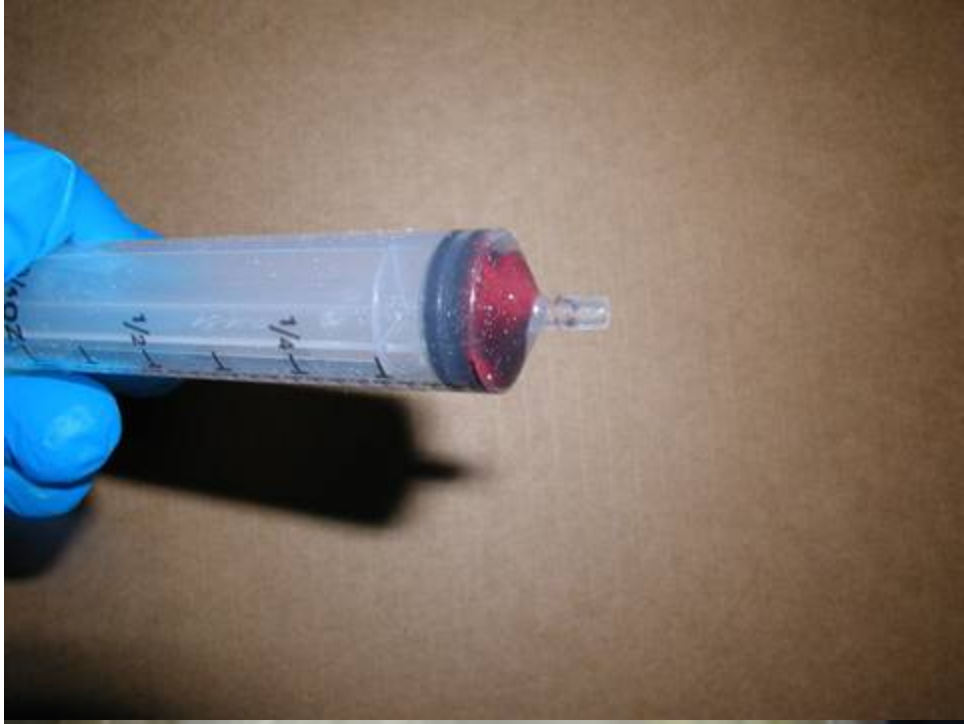
Recyclable Waste Issues

- These are pictures of inappropriate waste found in the recyclable waste on The MSU Medical Center campus (each picture is about one month's worth of waste)

Waste identified included surgical items such as booties, masks, gloves and hair bonnets

Laboratory supplies such as pipettes, rapid test kits and their wrappers and specimen containers were found

Biohazardous waste, including a syringe with blood in it and a bag of old dressings saturated with blood were identified



Other equipment and used linen were found

Numerous patient pill bottles and patient IV medications were found

Unused medical supplies and nearly full boxes of medical supplies were identified

NONE of the previously identified waste is recyclable waste!

- Recyclable waste includes:
  - Mixed paper
  - Cardboard
  - Aluminum cans
  - Aerosol cans
  - Surplus equipment
  - Printer cartridges
  - Scrap metal

PROPER SEGREGATION OF WASTE CREATES A HEALTHIER PLANET FOR ALL OF US!