

DISPOSAL OF HAZARDOUS AND SPECIAL WASTE MATERIALS POLICY

PURPOSE

The purpose of this policy is to provide guidance regarding the management of hazardous and special wastes so they are disposed of using safe, legal, and environmentally-responsible methods.

POLICY STATEMENT

It is the policy of The University of Texas MD Anderson Cancer Center (MD Anderson) to handle and dispose of hazardous and special waste generated at the institution in accordance with the regulations of the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Federal Department of Transportation (DOT), Texas Department of State Health Services (TX-DSHS), the Texas Commission on Environmental Quality (TCEQ), and any other regulations and standards to which MD Anderson subscribes.

SCOPE

Compliance with this policy is the responsibility of all faculty, trainees/students, and other members of MD Anderson's workforce.

TARGET AUDIENCE

The target audience of this policy includes, but is not limited to, all faculty, trainees/students, and other members of MD Anderson's workforce who generate or handle hazardous or special wastes at MD Anderson facilities.

DEFINITIONS

Contaminated: The presence or the reasonably anticipated presence of blood or other potentially infectious body fluid, chemicals, pharmaceutical compounds, or radioactive materials on waste materials.

Hazardous Waste: Includes materials that have any of the following characteristics:

- Flammable (e.g., alcohol, xylene);
- Toxic (e.g., mercury, arsenic);
- Corrosive (e.g., acids, bases); and
- Reactive/unstable (e.g., ether, cyanogen bromide, picric acid); or

- Specifically listed as a hazardous waste under the EPA's Resource Conservation Recovery Act (RCRA).

Infectious Waste: See Regulated Medical Waste.

Microbiological Waste: Includes the following:

- Discarded cultures and stocks of infectious agents and associated biological National Institutes of Health (NIH)/Centers for Disease Control and Prevention (CDC) agents.
- Discarded cultures of specimens from medical, pathological, pharmaceutical, research, and clinical laboratories.
- Discarded live and attenuated vaccines.
- Discarded, used disposable culture dishes.
- Discarded, used disposal devices used to transfer, inoculate, or mix cultures.

Non-Regulated Laboratory Glassware/Plasticware: Any item that is not a sharp, has not been in contact with infectious agents, or has not been used in animal or human patient care or treatment at a medical, research, or industrial laboratory but could potentially puncture a regular waste bag and pose a hazard to waste handlers. This includes, but is not limited to, non-infectious slides, cover slips, vials, Pasteur pipettes, empty chemical reagent bottles, laboratory glassware, and broken or fragile glass or plastic.

Pathological Waste: Pathological waste includes, but is not limited to:

- Human materials removed during surgery or biopsy, not stored in preservation liquids.
- Laboratory specimens of blood and tissue after completion of laboratory examination.
- Unfixed human / animal tissues or organs other than intact skin.
- Waste from animals intentionally exposed to pathogens. Animal waste includes carcasses, body parts, blood and blood products, and bedding.

Pharmaceutical and Cytotoxic Wastes: Waste materials generated from patient care activities or laboratories containing or used in work involving cytotoxic agents. Cytotoxic substances are mainly drugs that may be carcinogenic, mutagenic, and/or teratogenic and may disturb the fundamental mechanism of cell growth and differentiation. Examples of materials considered to be "cytotoxic waste" include, but are not limited to: syringes, tubing, sharps, vials, ampules, etc. used to treat a patient with an anti-neoplastic drug, or animal bedding from animals treated with a toxic chemical.

Radioactive Waste: "Any material (solid, liquid, or gas), which emits radiation spontaneously," (Texas Administrative Code 25 TAC 289). Some examples would be clinical and research laboratory chemicals and materials incorporating radioactive isotopes, such as hydrogen-3 (tritium), carbon-14, and phosphorus-32.

Regulated Glassware: See Chemical Laboratory Apparatus section of the [Clinical and Laboratory Glassware/Plasticware Disposal Policy \(UTMDACC Institutional Policy # ADM0959\)](#) for specific equipment.

Regulated Medical Waste: Liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed, items that are caked with dried blood or other potentially infectious materials,

and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Regulated medical waste also includes:

- Trace chemotherapeutic waste (e.g., IV bags, tubing, syringes, sharps, vials, ampules, containing or contaminated with trace or residual amounts of chemotherapeutic or anti-neoplastic agents used to treat a patient).
- Miscellaneous waste or equipment contaminated with infectious agents or hazardous materials; and
- Cell lines, unless deactivated (e.g., cancer cell lines and primary human cell lines), and recombinant DNA molecules.

Sharps: When contaminated, the following must be managed as regulated medical waste:

- Scalpel blades.
- Razor blades, disposable razors, and disposable scissors.
- Intravenous stylets and rigid introducers.
- Glass Pasteur pipettes, glass pipettes, specimen tubes, blood culture bottles, and microscope slides.
- Broken glass from laboratories.
- Hypodermic needles and hypodermic syringes with attached needles, regardless of contamination.

Special Waste From Health Care-Related Facilities (SWFHCRF or Special Waste): Includes the following:

- Pharmaceutical and Cytotoxic Waste.
- Radioactive Waste.
- Regulated Medical Waste.

Universal Waste: A hazardous waste defined by the EPA in 40 CFR Part 273:

- Batteries as described in Section 273.2. Includes rechargeable batteries, such as lead acid batteries (automotive and sealed lead-based), nickel-cadmium (NiCad), nickel-metal hydride (NiMH), and lithium-ion or lithium-ion polymer batteries (Li-ion).
- Pesticides as described in Section 273.3. Pesticides are described as any substance or mixture of substances intended to prevent, destroy, repel or mitigate pests, or intended to use as a plant regulator, defoliant, or desiccant.
- Mercury-containing equipment including thermostats as described in Section 273.4. Thermostats are a temperature control device containing a metallic mercury ampule attached to a bimetal sensing element. Thermostats refers to the device and the mercury-containing ampules.

- Lamps as described in Section 273.5. Lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. Lamps noted for high mercury content are managed as universal waste.

and by the State of Texas 30 TAC 335, Division 5, which allows for one additional category of Universal Waste in addition to the four mentioned above:

- Paint and Paint-Related waste as described in 30 TAC 335.262.

PROCEDURE

1.0 Hazardous Chemical Waste Management

1.1 Liquid Waste:

Liquid waste mostly consists of spent solvents characteristic for ignitability, toxicity and corrosivity used from processing activities. Liquid wastes, when compatible, may be designated into specific hazardous waste profiles and can be accumulated in Environmental Health & Safety (EH&S) issued waste containers. Incompatible liquid waste or those with high toxicity must be placed in individual waste containers to prevent adverse chemical reactions. Liquid wastes in their original forms may be disposed in original containers.

1.2 Solid Waste:

Solid waste may be generated from laboratory waste or may consist of out-of-date and off-specification products. Solid waste cannot be mixed with other materials, and must be stored in separate containers or may be disposed of in their original containers.

1.3 Storage:

All hazardous waste must be labeled and stored properly when in storage. Label containers as "Hazardous Waste". Identify chemical composition for liquid mixtures. Store hazardous waste in identifiable satellite accumulation areas within appropriate and compatible secondary containment. Ensure chemicals are stored according to compatibility and are closed when not in use.

1.4 Disposal:

Complete the on-line waste disposal form to schedule EH&S collection.

1.5 Empty Containers:

Empty containers in this policy refer to empty containers once containing hazardous materials. When containers have less than 3% of the original contents remaining, they may be disposed as solid waste. Deface chemical labels, mark container as "Trash" or "Empty" and place near regular trash. Housekeeping collects empty containers. When disposing of a large amount of glass containers, place empty containers in a cardboard box and mark the outside of the box for trash disposal.

1.6 Acutely Hazardous Waste:

All chemical waste and empty containers identified as acutely hazardous waste by the EPA (P-listed) must be disposed with EH&S. Common examples include arsenic trioxide, sodium azide, and cyanides. For additional information regarding acutely toxic wastes and disposal, contact EH&S.

2.0 Pharmaceutical and Cytotoxic Waste Management

2.1 Enrollment:

Contact EH&S for information regarding the pharmaceutical waste management program and enrollment. The pharmaceutical waste management program is a partnership program with service support from EH&S and contracted services.

2.2 Storage:

For the proper management of hazardous pharmaceuticals and waste, segregate waste into non-hazardous and hazardous waste streams based on the identification of the material. Place non-hazardous pharmaceutical waste into blue non-hazardous waste containers. Place hazardous pharmaceuticals into black hazardous waste containers. Hazardous pharmaceuticals exhibiting incompatible characteristics must be bagged and placed in an incompatible black waste container.

2.3 Disposal:

Complete the on-line waste disposal form to schedule EH&S collection when not placed on a routine service schedule.

3.0 Universal Waste

3.1 Storage:

All universal waste must be stored in designated areas marked as a universal waste accumulation area. Wastes must be stored in containers or boxes and must remain closed when not in use. All containers must be labeled with the words "Universal Waste" and provide a description of the waste contents. Mark each container with start date of accumulation. Maximum accumulation for universal waste is one year.

3.2 Disposal:

Complete the on-line waste disposal form to schedule EH&S collection when containers are full or before the one-year storage accumulation date expires.

4.0 Regulated Medical Waste/Infectious Waste Management (Includes Pathological and Microbiological Waste)

4.1 Liquid Waste:

Free-flowing or bulk liquids are not permitted in medical waste containers and must be disposed via the sanitary sewer when possible.

- A. Prior to disposal, deactivate infectious substances by adding a 10% disinfectant (EPA-registered; bleach) solution to the mixture. Immerse or let stand for at least 20 minutes prior to sewer disposal. Using personal protective equipment, dispose of liquid mixtures via the sanitary sewer.
- B. When sewer disposal is not possible, bulk liquids must be solidified using commercial solidification agents. If solidification agents are unavailable, absorbent materials must be placed in the bottom of the medical waste container. The container shall contain enough absorbent material to absorb 150% of the volume of free liquids.

- C. For waste containing residual liquids, place absorbent material on the bottom of medical waste containers. Acceptable absorbents include solidifiers, kitty litter, or absorbent towels.
- D. Liquids waste does not include human excrements unless contaminated with blood or spent chemotherapeutic drugs. Non-contaminated human excrements must be disposed via the sanitary sewer.
- E. Waste pharmaceutical containers containing liquids in their commercial form may not be disposed via the sanitary sewer or in medical waste containers. Contact EH&S for enrollment in the pharmaceutical waste program.

4.2 Solid Waste:

- A. Place waste material into a biohazard container lined with a red bag.
- B. Solid waste shall be accumulated in a reusable container or a biohazard box lined with a biohazard red bag. Use of reusable containers is preferred in patient care operations.
- C. Double bag solid wastes that pose a risk to puncture through a biohazard bag due to shape, weight, or size of materials.
- D. Fill medical waste containers only $\frac{3}{4}$ full to ensure enough room to securely close the biohazard bag for disposal. See Section 4.5, Closure Requirements.
- E. Biohazard boxes should contain no more than 40 pounds of materials.
- F. Trace chemotherapeutic waste or chemotherapy spill debris is approved for medical waste disposal. Medical wastes are sent off-site for incineration.
- G. Tissues stored in formalin/formaldehyde containers must be drained of all fluids before placing in biohazard waste containers. Fluids must be managed as hazardous waste in accordance with this policy.
- H. Untreated Category A Infectious Substances is prohibited. For Biohazard Level 3 - All culture stocks and other regulated wastes must be decontaminated before disposal by an approved decontamination method, such as autoclaving. Materials to be decontaminated outside the immediate laboratory should be placed in a durable, leak-proof container, and closed for transport from the laboratory.

4.3 Sharps:

- A. Place sharps in marked, puncture-resistant rigid containers designated for sharps.
- B. Containers must be secured with lid intact during use.
- C. Select and utilize sharps containers based on standard operations.
- D. Non-leak proof sharps containers (containers without lid gaskets) must be placed in a biohazard container lined with a red, plastic biohazard bag for disposal.

4.4 Storage:

Storage of regulated medical waste must follow the standards outlined within the institutional [Exposure Control Plan Policy \(UTMDACC Institutional Policy # CLN0428\)](#).

4.5 Closure Requirements:

- A. When a biohazard bag is $\frac{3}{4}$ full, prepare to close the container.
- B. Use caution when handling regulated medical waste. Utilize personal protective equipment and do not push on the bag at any time.
- C. Grab the liner edge and twist the bag into a single braid.
- D. Use the braid to tie a single knot in the bag.
- E. Secure the red bag in a biohazard box. If removing a bag from a reusable container, place the bag into a biohazard box using the inner rigid liner to transport the material.
- F. Close the biohazard box and label with room number and department name. Contact Housekeeping for waste collection.
- G. Biohazard boxes will not be collected if wastes are not closed, properly packaged, are damaged and leaking or exceed the 40 pound weight limit. If biohazard boxes do not meet these standards, personnel will be required to repack materials accordingly.

4.6 Off-site Transport Requirements:

Biohazard containers placed in final accumulation sites for off-site transport must be labeled with barcode stickers for medical waste transport. Staff must affix each box with labels containing specific information per DOT and state regulation.

5.0 Radioactive Waste Management

5.1 Green-10 Patient Room Clearance - Call EH&S at 713.792-2888 for instructions.

5.2 Solid Radioactive Waste:

Waste consisting of plastic pipettes, gloves, absorbent pads, plastic contaminated materials, and items used with radioactive materials. Waste items shall be free of radioactive tape, symbols, or labels and should not contain any biological materials.

A. Storage:

Segregate waste by half-life (<300 days & >300 days). Store waste in a closed impervious, plexiglass container lined with two plastic liners and absorbent materials placed at the bottom. Label waste container with radiation warnings and identification of radioisotope in storage. Never mix solid waste with liquid scintillation vials.

B. Disposal:

Close inner liner containing waste and label with EH&S issued radioactive waste labels. Complete the on-line waste disposal form to schedule EH&S collection.

5.3 Stock Vials:

Glass or plastic vials that hold concentrated radioactive isotopes.

A. Storage:

Segregate by half-life (<300 days & >300 days).

B. Disposal:

If empty, deface radiation labels and place with solid radioactive waste. If full, place stock vials in a small plastic bag and label with EH&S issued radioactive waste labels. Complete the on-line waste disposal form to schedule EH&S collection.

5.4 Liquid Scintillation (LS) Vials:

Glass or plastic vials containing liquid scintillation cocktails (including sample materials) or vials used for scintillation counting.

A. Storage:

Segregate waste by half-life (<300 days & >300 days). Store waste in a closed impervious, plexiglass container lined with two plastic liners and absorbent materials placed at the bottom. Label waste container with radiation warnings and identification of radioisotope in storage. Never mix liquid scintillation vials with solid waste.

B. Disposal:

Close inner liner containing waste and label with EH&S issued radioactive waste labels. Complete the on-line waste disposal form to schedule EH&S collection.

5.5 Biological (Animal):

Animal waste containing contaminated, radioactive carcasses, tissue samples, or bedding.

A. Storage:

Segregate by half-life (<300 days & >300 days). Place animal waste in a plastic bag. Label waste with radiation warnings and detailed waste information. Place waste in freezer (-20C).

B. Disposal:

Call EH&S at 713-792-2888 to request EH&S assistance.

5.6 Liquid Radioactive Waste:

Aqueous or chemical mixtures containing radioisotopes.

A. Storage:

Segregate by half-life (<300 days & >300 days) when possible. Place liquid waste in a container that is compatible with inner contents. Label waste container with EH&S issued radioactive waste labels. Buffer solutions may be labeled as aqueous waste.

B. Disposal:

Complete the on-line waste disposal form to schedule EH&S collection.

5.7 Sewer Disposal of Liquid Radioactive Waste:

Limited quantities of liquid radioactive waste may be disposed of to the sanitary sewer provided prior authorization is received from the Radiation Safety Officer in writing.

Specific requirements include the following:

A. Waste contains < 500 millicuries per radioisotope per week;

- B. Radioisotopes must be listed on the user's Authorization;
- C. Waste is water soluble;
- D. Waste is otherwise non-hazardous;
- E. Sink and trap are labeled for radioactive materials;
- F. Written records are kept of disposed activities with associated dates of disposal; and
- G. A copy of the sewer disposal approval is kept available in the laboratory for reference.

5.8 Non-Regulated Laboratory Glassware/Plasticware and Broken Glass:

Place in a broken glass container or cardboard box labeled "Broken Glass," seal with tape, and place near regular trash for Housekeeping to pick up.

5.9 Regulated Glassware:

Regulated glassware requires an inventory, security, and specialized disposal procedures to meet the requirements of DPS MOU as defined in the [Clinical and Laboratory Glassware/Plasticware Disposal Policy \(UTMDACC Institutional Policy # ADM0959\)](#).

6.0 Responsibility

It is the responsibility of all faculty, trainees/students, and other members of MD Anderson's workforce and all contractors to comply with this policy. The EH&S Department will investigate discrepancies.

7.0 Exceptions

Any exceptions to an established policy are at the discretion of the Institutional Safety Committee. All exceptions must be reviewed by this committee on an annual basis.

ATTACHMENTS / LINKS

None.

RELATED POLICIES

[Clinical and Laboratory Glassware/Plasticware Disposal Policy \(UTMDACC Institutional Policy # ADM0959\).](#)

[Exposure Control Plan Policy \(UTMDACC Institutional Policy # CLN0428\).](#)

JOINT COMMISSION STANDARDS / NATIONAL PATIENT SAFETY GOALS

“The hospital manages medical equipment risks.” Standard: EC.02.04.01. Comprehensive Accreditation Manual for Hospitals (CAMH), July 2013.

“The hospital manages risks related to hazardous materials and waste.” Standard: EC.02.02.01. Comprehensive Accreditation Manual for Hospitals (CAMH), July 2013.

“The hospital manages safety and security.” Standard: EC.02.01.01. Comprehensive Accreditation Manual for Hospitals (CAMH), July 2013.

“The hospital plans activities to minimize risks in the environment of care.” Standard: EC.01.01.01. Comprehensive Accreditation Manual for Hospitals (CAMH), July 2013.

OTHER RELATED ACCREDITATION / REGULATORY STANDARDS

Definition, Treatment, and Disposition of Special Waste from Health Care Related Facilities, Texas Department of State Health Services, State of Texas 25 TAC 1.131 – 1.137.

General Industry, OSHA Safety and Health Standards, 29 CFR 1910.

Guide for Infectious Waste Management, U.S. Environmental Protection Agency.

Industrial Solid Waste and Municipal Hazardous Waste, Texas Commission on Environmental Quality, State of Texas 30 TAC, Chapter 335.

Municipal Solid Waste, Texas Commission on Environmental Quality, State of Texas 30 TAC Chapter 330.

Radioactive Substances Rules, Texas Commission on Environmental Quality, State of Texas 30 TAC Chapter 336.

Regulations for Control of Radiation, Texas Department of State Health Services. State of Texas 25 TAC, Chapter 289.

Resource Conservation Recovery Act, Environmental Protection Agency , 40 CFR Parts 260 - 282.

U.S. Department of Transportation, 49 CFR, Parts 100-177.

REFERENCES

CDC/NIH Biosafety in Microbiological and Biomedical Laboratories; 5th edition, Dec 2009; U. S. Department of Health Human Services, Public Health Service.

The University of Texas MD Anderson Cancer Center Infection Control Manual.

The University of Texas MD Anderson Cancer Center Radiation Safety Manual.

POLICY APPROVAL

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RESPONSIBLE DEPARTMENT(S)

Environmental Health & Safety