

UNIVERSITY OF CALIFORNIA SANTA BARBARA
Medical Waste Management Plan
Large Quantity Generator with Onsite Treatment 417

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I. Introduction

The University of California at Santa Barbara is committed to maintaining a safe and healthful environment for students and employees. This Medical Waste Management Plan details the UCSB procedures regarding the safe handling, treatment, and disposal of medical waste at University-owned facilities. The Plan is reviewed annually and updated as necessary to meet the requirements of the California Medical Waste Management Act of 1990 (MWMA 1990). The Act applies to all departments generating medical waste, and requires that UCSB track and account for medical waste. This Plan is complemented by the Student Health Medical Waste Management Plan developed by that department for human healthcare applications.

II. Definitions

117630 - *Biohazard bag* means a disposable film bag that is impervious to moisture. The color of the bag shall be red, labeled with the biohazard symbol, and tested to meet impact and tear resistance standards.

Film bags that are used for transport off campus prior to treatment must be marked and certified by the manufacturer as having passed the tests prescribed for tear resistance in the American Society for Testing Materials (ASTM) D1922, "Standard Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method" and for impact resistance in ASTM D1709, "Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method." Film bags must meet an impact resistance of 165 grams and a tearing resistance of 480 grams in both parallel and perpendicular planes with respect to the length of the bag.

Biohazardous waste is medical waste, including:

- a. Laboratory waste, including specimen cultures from medical and pathological laboratories; cultures and stocks of biohazardous materials from research; clinical and teaching laboratories; wastes from the production of biological agents; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate and mix cultures or material which may contain any biohazards.
- b. Human blood (including articles contaminated with blood), components of blood or body fluids such as cerebrospinal fluid, synovial fluids, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. An exception to this is when the body fluid contaminant will dry within a couple of hours and does not have enough liquid phase so as to drip from the article, that contaminated article may be treated as "Treated Medical Waste."
- c. Surgical specimens including human or primate animal parts or tissues removed surgically or by autopsy. This does not include uninfected non- primate animal wastes.
- d. Such other waste materials that result from the administration of medical care to a patient by health care providers and are found by the administering agency or the local Health Officer to pose a threat to human health or the environment.

117690 - *Medical waste* includes any biohazardous, pathology, pharmaceutical, or trace chemotherapy waste not regulated by the federal Resource Conservation and Recovery Act of 1976 (Public Law 94-580), as amended; sharps and trace chemotherapy wastes generated in the diagnosis, treatment, immunization, or care of humans or animals; waste generated in research pertaining to the production or testing of microbiologicals; waste generated in research using human or animal pathogens.

Pharmaceutical waste is any prescription or over-the-counter human or veterinary drug that is a waste. Pharmaceutical waste does not include any pharmaceutical that is regulated pursuant to the federal Resource Conservation and Recovery Act of 1976 or the Radiation Control Law, or any pharmaceutical that is sent out to a reverse distributor.

Sharps waste is medical waste when it is generated during activities involving biohazardous substances. Sharps waste includes objects or devices having acute rigid corners, edges or protuberances capable of cutting or piercing (glass pipettes, hypodermic needles, blades, slides and broken glass).

Treated Medical Waste does NOT include biohazardous waste or infectious waste, but DOES include objects which may (to the uninformed individual) look like they are contaminated with biohazardous material including:

- Autoclaved biohazardous waste
- Empty (will not drip when inverted) specimen containers
- Bandages or dressings containing non-liquid blood
- Surgical gloves
- Decontaminated biohazardous waste
- Other materials which are not biohazardous

III. Responsibilities

Autoclave Custodian arranges or performs basic maintenance, cleaning and schedules the annual calibration of the autoclave(s) by an outside vendor (e.g., Technical Safety Services, Inc.)

Campus Biosafety Officer coordinates campus compliance to the MWMA 1990, approves the purchase of autoclaves, and provides refresher training on treating medical waste by steam sterilization.

Departmental designees are responsible for recordkeeping and testing of the autoclave(s). Designees test and assure proper operation of the unit(s), notify the Campus Biosafety Officer at EH&S when an autoclave is removed or installed, notify users when an autoclave is not functioning properly, and notify parties for maintenance when needed.

EH&S is responsible for providing guidance to labs generating medical waste, and for monitoring campus compliance with mandated medical waste guidelines. EH&S is available to provide training to campus medical waste generators when requested.

Laboratory workers (research assistants, graduate students, and undergraduate students) are

responsible for following the instruction of the principal investigator concerning medical waste handling, storage, and disposal.

Principal Investigator is responsible for training of all workers in their laboratory and ensuring that medical and biohazardous wastes are handled, stored, treated, and disposed of properly and safely. They must also provide the equipment necessary to maintain compliance with the Medical Waste Management Act.

IV. Types and Quantity of Medical Waste Generated

The types of medical waste generated on campus, and excluding the types of medical waste generated at UCSB Student Health Services, are listed below.

- 1) Sharps waste
- 2) Biohazardous waste
- 3) Pathology waste
- 4) Pharmaceutical waste

Types of medical waste **not** generated:

- Trace chemotherapy waste
- Recognizable human anatomical remains
- Mixed waste, i.e., medical and hazardous or medical and radiological waste

Estimated monthly medical waste: 23 kilograms (kg)

V. Containment and Storage

Medical waste is segregated from other waste at the point of generation. Biohazardous waste is collected in bags which are red, conspicuously labeled with the words "Biohazardous Waste" or with the international biohazard symbol and the word "BIOHAZARD," and are certified by the manufacturer as having passed the ASTM D1922 and ASTM D1709 tests.

Red biohazard bags are placed for storage, handling, and transport in rigid containers with tight-fitting lids labeled with the words "Biohazardous Waste," or the word "Biohazard," and the international biohazard symbol on the lids and sides so as to be visible from any lateral direction. Red biohazard bags are twisted and securely tied when full. In research laboratories on campus, red biohazard bags are kept in secondary containment from the time of waste generation, during treatment, and until disposal in the wheeled totes designated for laboratory waste. (Note: Red biohazard bags are not hand-carried to autoclaves.)

- Storage for untreated, bagged biohazardous waste shall be secured to deny access to

unauthorized personnel.

- Exterior doors will be marked with the international biohazard symbol
- Maximum storage time:
7 days or less when stored above the temperature 0°C
OR
90 days or less when stored below 0°C

Note: Reusable rigid medical waste containers are cleaned once a week or as needed, whichever comes first. The protocol is to don disposable gloves, prepare a solution of sodium hypochlorite (10% household chlorine bleach solution), and use it with disposable paper towels to wipe down the interior and exterior surfaces.

Medical waste is accumulated in individual laboratories in which medical waste is generated. Individual laboratories are secured so as to prevent or deny access by unauthorized persons and posted with warning signs, on or adjacent to, the exterior of the entry doors, on entry doors, gates, or lids. These warning signs are in both English and Spanish as follows: CAUTION—BIOHAZARDOUS WASTE STORAGE AREA—UNAUTHORIZED PERSONS KEEP OUT, and in Spanish: CUIDADO—ZONA DE RESIDUOS BIOLÓGICOS PELIGROSOS—PROHIBIDA LA ENTRADA A PERSONAS NO AUTORIZADAS.

Biohazardous sharps waste is disposed of in sharps containers that are leak-proof, rigid, puncture-resistant and “tamper-proof,” i.e. made so that they cannot be reopened without difficulty. Medical waste sharps containers shall be labeled with the words “sharps waste” with the international biohazard symbol and the word “BIOHAZARD.” All emptied sharps (needles, syringes, broken glass vials, broken ampules, blades, etc.) are deposited into a sharps waste container labeled with the biohazard symbol and/or “Bio-Hazard Warning Sharps.” When the container is full (reaches 2/3 capacity or the manufacturer’s full line indicated on the sharps waste container), it is tightly closed or taped shut to prevent loss of contents prior to disposal. (Note: Needles and syringes shall not be clipped, bent, broken, sheared or recapped prior to disposal.)

Pathology waste, i.e., infectious animal carcasses, is bagged in red biohazardous waste bags, tied closed, and stored in a -20°C freezer located in the anteroom to the ABSL2 laboratory in the Animal Resource Center. Pathology waste is transferred to the pickup location used by the licensed commercial medical waste hauler in a rigid and lidded container labeled as “PATHOLOGY WASTE.”

VI. Onsite Treatment

All onsite solid medical waste treatment is performed using autoclaves. The parameters for the disinfection and sterilization of medical waste are established by the California Department of Public Health. Medical waste is treated at a minimum of 121-124°C (250-255°F), for at least 30 minutes, at 15 psi. Autoclave users are trained to ensure that the medical waste load has reached a temperature of at least 121°C for at least 30 minutes for adequate treatment. If the load did not reach both criteria of temperature and duration, staff shall re-run the load until it has been successfully treated.

Red biohazard bags are transported to the autoclave in secondary containers for immediate treatment. Approximately 100 milliliters of water is added to red biohazard bags to facilitate heat transfer and sterilization of the contents. Autoclave bags are loosely closed with tape, with a 1-inch diameter opening, through which steam enters and hot gases escape. Autoclave users must position the bag neck at the top and center, such that no liquid in the bag can drip out into the autoclave pan or directly onto the autoclave base. Plastic or stainless steel secondary containers are used to contain bags during autoclaving. Polypropylene or polycarbonate plastic pans with 6-12 inch sides are typically used because these plastics withstand autoclaving without melting. Stainless steel containers are durable but a good conductor of heat.

Sharps containers are sealed and hand carried or transferred on a cart with wheels and into the autoclave room for immediate treatment. Untreated sharps containers are not accumulated in the autoclave room.

Liquid medical waste is treated with an EPA-registered, tuberculocidal disinfectant, for the contact time specific to the disinfectant, prior to discharge to the public sewer system.

All records of attainment pertaining to onsite treatment are maintained for a period of not less than three years.

Pharmaceutical waste is not treated on campus.

VII. Disposal

Medical waste is either treated onsite and then disposed of as solid waste to a class III landfill, or shipped offsite to a permitted treatment facility by a licensed hauler.

Treated red biohazard bags are placed inside rigid-walled totes designated for autoclaved laboratory waste.

Biohazardous sharps waste containers are autoclaved and then labeled with the words "autoclaved." Generators submit an online *Chemical Waste Collection Request* via the EH&S

website or leave the autoclaved container in an approved location that will be picked up without a request. Alternatively, investigators may contract with a certified medical waste management company to pick up biohazardous sharps waste. UCSB EH&S does not accept “home generated sharps waste.”

Pathological waste is picked up from the Animal Resource Center vivaria and shipped offsite to a permitted treatment facility by a licensed hauler.

Pharmaceutical waste not meeting the definition of a RCRA hazardous waste or a DEA Controlled Substance is disposed of through the EH&S Hazardous Waste Program as hazardous chemical waste. Pharmaceutical waste managed by EH&S is packaged according to Department of Transportation regulations and transported offsite for incineration by Clean Harbors, Inc., 880 W Verdulera St, Camarillo, CA 93010, telephone (805) 987 – 0217, web www.cleanharbors.com.

Pharmaceutical wastes classified by the DEA as “Controlled Substances” are disposed of according to 21 CFR §1307.21. Controlled substance waste that is generated on campus is sent to a reverse distributor, EXP Pharmaceuticals Services Corporation, 48021 Warm Springs Blvd, Fremont, CA 94539, telephone (510) 476-0909, web www.expworld.com.

VIII. Autoclave Monitoring

Autoclave Monitoring for Individual Cycles of Medical Waste

- *Temperature Monitoring* - Operators must verify and retain a legible readout from thermometers for each complete cycle showing the attainment of a minimum temperature of 121°C or 250°F for at least 30 minutes, depending on quantity and compaction of the load. The start time for the cycle is taken when the thermometer reaches 121°C (250°F). Note: Longer cycle time and / or higher temperatures may be necessary to effectively sterilize a load.
- *Heat Sensitive Monitoring* - Operators must use heat-sensitive tape or autoclave bags with an integrated indicator that serve as a visual cue that the load has undergone the steam sterilization process. Heat sensitive tape and integrated indicators only indicate that the proper temperature has been reached, but they do not indicate that the load was heated for the proper duration.
 - In the event that the heat sensitive indicator has not changed color and/or the thermometer indicates that the proper sterilization temperature was not reached, verify the cycle on the autoclave control panel, re-enter the cycle if necessary, and process the load again. If there is a second failed autoclave run, contact the autoclave custodian for repair.

Autoclave Monitoring for Annual Permit to Treat Medical Waste

- *Annual Calibration* - Thermometers, thermocouples, or other monitoring devices identified in the facility operating plan shall be checked for calibration annually. Records of the calibration checks shall be maintained as part of the facility's files and records for a period of no less than two years.
- *Spore Tests* – Autoclave Custodians must use the biological indicator *Bacillus stearothermophilus* placed at the center of a load processed under standard operating conditions at least monthly to confirm the attainment of adequate sterilization conditions. Autoclave Custodians are responsible for retaining and producing the monthly 'spore test results' records to the State for the annual inspection.
- *Retain "Records of Attainment"* – Retain autoclave print-outs that the autoclave cycle proceeded correctly for 3 years.
- *Annual Inspection by CDPH* – Autoclave Custodians submit or have available annual calibration records, spore test results, annual refresher training records, and records of autoclave temperature/duration for each run of medical waste.

IX. Annual Worker Training and Documentation

An autoclave safety training program has been developed and implemented. All users are required to attend a training presentation and to obtain a hands-on demonstration before operating an autoclave. Annual training for the operators shall be provided after the initial training has been completed. The training shall be documented and the documentation shall be retained at the facility for a minimum of two years. Training shall comply with applicable federal Occupational Safety and Health Administration regulations, including those found in Section 1910 of Title 29 of the Code of Federal Regulations. Written standard operating procedures are readily accessible and posted alongside autoclaves. Personnel are required to wear dry, heat resistant gloves and closed-toe shoes; eye protection and a lab coat are recommended.

Autoclave training includes:

- Proper operation of autoclaves used for onsite medical waste treatment
- Established parameters and procedures for onsite treatment
- Proper protective equipment to wear
- Spill clean up

All workers and researchers who generate medical waste and to whom the California Bloodborne Pathogen Standard applies receive safety training annually. The training shall include:

- Universal precautions
- HIV, HBV, and HCV specific information
- Investigation and tracking of any biohazardous sharps related injuries
- Exposure information specific to their experimental protocols
- Hepatitis B vaccination/declination

All medical waste handling shall be performed using universal precautions, as though the waste is potentially infectious.

X. Spill Procedures

All biological use authorizations include spill response procedures prior to Institutional Biosafety Committee approval. Spills at UCSB could be related to bench top work, research equipment accidents (centrifuges, vortexers, cell homogenizers, etc.), or transport of infectious materials within a campus building. All wastes generated as a result of spill cleanup activities are treated according to the category of material spilled. For any spills containing treated or untreated medical waste, nearby persons are required to move away from the spill, and the spilled material is treated with one of the following:

- Sodium hypochlorite (10% household chlorine bleach solution)
- Phenol solution (500 ppm active agent)
- Iodoform (100 ppm available iodine)
- Quaternary ammonia solution (400 ppm active agent)

Anyone exposed to human or non-human primate blood or fluids shall be referred to a physician for further treatment. The exposure follow up required by the Bloodborne Pathogens Standard shall be performed, along with reporting and record keeping requirements.

XI. Emergency Plan

If an autoclave is not working properly, use is discontinued immediately. A sign is posted alerting others not to use the autoclave, and the Autoclave Custodian is notified of the need for repair.

Emergency Action Plan Options:

- 1) There are multiple autoclaves registered with CDPH for the treatment of medical waste. In the event that an autoclave permitted for the treatment of medical waste is down for maintenance, untreated medical waste is kept in secondary containment, loaded onto a cart with wheels, and transported to another unit that is registered with CDPH.
- 2) Laboratory facilities are equipped with -20°C and -80°C freezers. In the event that an autoclave is not available for use, biohazardous waste and sharps waste may be stored in the freezer until treatment.

XII. Closure Plan

Pursuant to 117935(i), this MWMP has a closure plan for the termination of medical waste treatment in order to render the property to an acceptable sanitary condition following the

completion of services. Relevant sites will be decommissioned by Technical Safety Services, Inc. (TSS). TSS will perform validated decontamination procedures of treatment sites and provide third party certification of the site closure. The Los Angeles branch serves UCSB.

Contact Information for Closure Plan Completion:
TSS, 511 South Harbor Blvd, Suite K, La Habra, CA 90631
Telephone (562) 694 – 3623
Web www.techsafety.com

XIII. Licensed Medical Waste Hauler

UCSB has contracted with Medical Waste Environmental Engineers for transportation and treatment of medical biohazardous and pathological waste. This company is registered with CDPH as a California state licensed medical waste hauler and treatment facility.

Waste Haulers:

Medical Waste Environmental Engineers
702 South Depot, Santa Maria, CA 93458
(805) 925-6633

Stericycle
28161 N. Keith Drive, Lake Forest, IL 60045
(847) 367-5910

Treatment Methods Available: Incineration
and Autoclave

Treatment Methods Available: Incineration
and Autoclave

XIV. Certification

117960 (i)

I certify the above information is true and correct.

Jamie Bishop, Campus Biosafety Officer

Review Date

Alex Moretto, Research Safety Division Manager

Review Date

Appendices

Appendix A

Registered Steam Sterilizers and Onsite Treatment Locations

A table of the steam sterilizers registered with the state of California is given below.

Note: One additional steam sterilization treatment unit may be permitted with CDPH, although it will not be ready and approved for use on the date of the annual inspection.

Building	Bldg.	Room	Model	Serial #	Brand	Capacity (lbs)	Ave. Monthly Quantity Treated (kg)
Chem.	557	1201	SR-26A-ADVPLUS	92413	Consolidated	44	20
CNSI	266	3208	69120 SP-1A	2812002	Tuttnauer	20	10
Bren Hall	521	2016	Amsco Eagle SV120	0100598-04	Steris	17	Infrequent
Bren Hall	521	2016	LS233	00E60873	Getinge	70	Infrequent
Bio II	571	4106	SSR-5A-PB	12105	Consolidated	66	30
Bio II	571	3182	SSR-3A-ADVPLUS	040414 (a)	Consolidated	132	30
Bio II	571	3182	SSR-3A-ADVPLUS	040314 (b)	Consolidated	44	30
LSB	235	2204	733LS	04E507	Getinge	88	10
LSB	235	2204	3AV-X1	111618	Getinge	70	10
Bio Eng.	512	2212	SSR-3A-ADVPLUS	60116	Consolidated	70	pending

Appendix B

Medical Waste Contact Information

Correspondence related to medical waste generation and onsite treatment at the University of California Santa Barbara may be sent to:

Jamie Bishop, Campus Biosafety Officer
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 Office of Environmental Health & Safety
 Santa Barbara, CA 93106-5132

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 Telephone (805) 893 - 8894