



University of Florida Biological/Biomedical Waste Training

Biological Safety Office
Environmental Health & Safety
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Biological vs. Biomedical Waste

- ▶ Biological waste - Solid or liquid waste which may present a threat of infection to humans, animals, crops, or natural ecosystem
 - Animal pathogens
 - Plant pathogens
 - Recombinant DNA organisms
 - Biological toxins
 - **Biomedical waste**
- ▶ Hazardous waste –at UF, used to describe chemical or pharmaceutical waste (see <http://www.ehs.ufl.edu/HMM/default.asp> for more information)

Biomedical Waste (BMW)

A subset of biological waste

- ▶ Solid or liquid waste which may present a threat of infection to humans. Includes:
 - Discarded sharps (*medical items intended to cut or puncture skin, e.g. needles, lancets, scalpels*)
 - Non-liquid human tissue and body parts
 - Blood, blood products and OPIM (as defined in OSHA BBP standard) from humans and other primates
 - Laboratory/clinical waste containing/contaminated with blood, tissue, cell cultures & other potentially infectious body fluids
 - Laboratory/veterinary wastes containing human disease-causing agents



Off-campus sites

- ▶ Commonly generated **biological** waste
 - rDNA organisms & vectors, plant pathogens, some animal pathogens, lab waste contaminated with these items

- ▶ Commonly generated **biomedical** waste
 - Sharps containers, some human pathogens

State Biomedical Waste Regulations

http://www.doh.state.fl.us/environment/community/biomedical/pdfs/64E16_1.pdf

- ▶ Segregation, handling, labeling, storage, transport & treatment of waste are regulated.
- ▶ Training – initial & annual
 - Training records must be kept a minimum of 3 years
- ▶ Site-specific Biomedical Waste Plan
 - UF BMW plan @ EH&S Biosafety (call 352-392-1591)
- ▶ Permits req'd to generate, store, treat, & transport BMW
- ▶ Inspections by the state (yearly, if exempt every 3 years)
- ▶ Enforcement
 - Suspend/revoke permits
 - Fines of up to \$2500/day/violation

How is BMW identified?

- ▶ International biological hazard symbol on the container



- ▶ The phrase "**Biomedical Waste**", "**Infectious Waste**" or "**Biohazardous**" must be on the container

- ▶ Bagged waste must be in **red bags**.



Segregation of BMW

- ▶ Segregated at **point of origin** into its proper container
 - "Point of origin" is the lab, patient/exam/procedure room or other area where the BMW is generated
- ▶ Choices for proper BMW container:
 - Red biowaste bag
 - Labeled fiberboard box lined with a red biowaste bag
 - Sharps container – puncture resistant container specifically designed for sharps



Do not mix biological/BMW with radioactive or chemical waste!


- ▶ Gloves, tubes, etc. contaminated with radioactive or chemical material does not go into a biomedical waste box. Place in appropriate waste container.
 - Radioactive → Chemical → Biological
- ▶ Call EH&S (352-392-1591) before putting hazardous (chemical) or radioactive warning stickers on biomedical waste containers or before autoclaving or bleach-treating chemical or radioactive waste.
- ▶ Remember – the biomedical waste box is not a universal disposal container!

Segregate medical sharps into sharps containers

- ▶ Never Re-Cap Needles or Scalpels
 - Don't bend, break, or detach from syringe
- ▶ Discard directly into a **leak-proof, puncture resistant container**
- ▶ Replace container when ¾ full
- ▶ Never attempt to re-open a closed sharps container
- ▶ Label container with the date, PI name, location (building/room #), and phone #



Sharps




- ▶ Container should be **located where the sharps are used**: patient rooms, procedure areas, exam rooms, lab, etc.
- ▶ Only sharps should go into sharps containers
 - **Soft items quickly overfill containers and may cause sharps to stick out of the top of the box.** Sharps boxes containing items other than sharps and syringes need to be replaced ASAP, but definitely within 30 days of first use.
- ▶ No drug bottles other than vaccines can go into sharps container.
 - If empty, rinse and dispose of in clean lab ware box (see http://www.ehs.ufl.edu/programs/chemrad_waste/labware/)
 - If not empty, must be picked up by EH&S Hazardous Waste

“Sharps”

- ▶ Sharps are regulated for disposal by Federal (OSHA) and State BMW regs. They are items **intended to cut or puncture skin** (needles, lancets, scalpels) & must go in an approved sharps container as biomedical waste.
- ▶ What about other sharp items (i.e. razor blades, Pasteur pipettes, broken glass)?
 - Place in a secondary container (plastic bottle, cardboard box, etc) before putting them in the trash.
- ▶ **Use red sharps containers only when absolutely necessary.**

What happens to non-sharp waste?

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| <h3><u>Biomedical</u></h3> <ul style="list-style-type: none"> • RED autoclave Bags –must meet certain documented standards of State of Fla. BBP & DOT e.g. Fisher # 01-828E (made by Medical Action Industries) • Store infectious or potentially infectious waste in covered, leak-proof container • Inactivate/autoclave • Bags are then placed in a BMW disposal carton from Stericycle | <h3><u>Biological</u></h3> <ul style="list-style-type: none"> • CLEAR autoclave Bags (Fisher 01-826-6) with approval of the Biosafety office • Inactivate/autoclave • Properly inactivated biological waste can be disposed of in the trash...but.... <ul style="list-style-type: none"> • No red bags • No sharps boxes • Nothing with a biohazard warning label |
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Handling biological/biomedical waste

- ▶ Wear appropriate PPE (gloves, clothing cover, safety glasses) when handling waste
- ▶ Transport waste in leak-proof containers
- ▶ Do not put liquids in bags! Liquids should be inactivated with bleach or autoclaved and put down sink.
- ▶ Know how to handle spills



Treatment of BMW

- ▶ BMW shall be treated by heat, incineration, or other equivalent method suitable for hazard inactivation acceptable to the State of Florida.
- ▶ UF/Shands BMW is treated by Stericycle, Inc.
 - Autoclave which sterilizes the waste or
 - Incineration which destroys the waste

Pretreatment of biological waste from UF labs prior to disposal by Stericycle

- ▶ At UF, all lab waste handled by UF custodial staff
- ▶ UF Policy:
 - Laboratory waste containing infectious, potentially infectious or rDNA organisms must be inactivated prior to leaving the facility
 - Properly performed autoclave or bleach treatment is acceptable
 - Storage of all non-inactivated waste in this category is restricted to within the generating laboratory
 - Specific requirements apply for waste containing biological toxins. Contact the Biological Safety Office at 352-392-1591



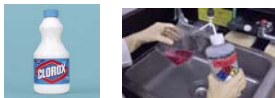
Autoclaving



- ▶ **Requirements:**
 - Biological indicator testing every 40 hrs of use (every 6 mos if autoclaving non-infectious material exclusively)
 - Log book
 - Regular maintenance
 - 250°F/121°C, 15-20 lb pressure
- ▶ Large loads/resistant pathogens need more time
 - Typical bag of biowaste = 60-90 min
- ▶ Transport waste to autoclave in closed bag and leak-proof container

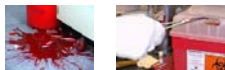
Chemical Inactivation

- ▶ Acceptable for liquid material if done correctly
 - Add **full strength household bleach** to final concentration of 10% (5000 ppm available chlorine).
 - Mix. Contact time should be at least 30 minutes.
 - Pour down drain to sanitary sewer.
- ▶ Use an EPA-listed “tuberculocidal disinfectant” – follow manufacturer’s instructions (see http://www.epa.gov/oppad001/list_b_tuberculocide.pdf)
- ▶ Some disinfectants = “hazardous chemicals”, harmful to work with and can’t go down drain, must be picked up by EH&S



BMW Spills & Surface Disinfection

- ▶ Proper spill handling:
 - Notify people in the area
 - Don appropriate PPE
 - Place absorbent material on spill
 - Apply appropriate disinfectant – allow sufficient contact time (30 min)
 - Pick up material (watch for glass – use tongs or dust pan); dispose of material into biomedical waste
 - Reapply disinfectant and wipe
 - For large/high hazard spills, call the Biosafety Office (352-392-1591)
- ▶ For routine disinfection of surfaces where BMW is handled, use a 1:10 solution of freshly diluted bleach or a tuberculocidal disinfectant (ethanol evaporates too quickly!)



Do you have a bio-spill kit?

- ▶ Container of undiluted household bleach
- ▶ Several pairs of gloves
- ▶ Safety glasses
- ▶ Absorbent material
- ▶ Biohazardous waste (autoclave) bags
- ▶ Dust pan & scoop or tongs for broken glass

Place in a labeled bag or bucket and keep in areas where biohazards are used



BMW Storage

- ▶ Storage area must be:
 - Away from general traffic/secure (locked/non-accessible)
 - Labeled with biohazard sticker
 - Easily cleanable & tidy
- ▶ Waste cannot be stored > 30 days
 - The 30 day period shall commence when the first non-sharps item of biomedical waste is placed into a red bag or sharps container, or when a sharps container containing only sharps is sealed.
- ▶ Packages must be labeled as biomedical waste with the biohazard symbol, name, location, phone & date
- ▶ Some locations:
 - Stage waste & then transport to outdoor containers removed for disposal by a designated hauler
 - Transport (in a state vehicle, <25 lbs at one time) to a designated pick-up point

PACKAGING AND DISPOSING OF BIOLOGICAL WASTE
 Handling biological waste must be done with Standard/Universal Precautions.

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*Black tape is used for demonstration purposes only. All boxes must be taped with CLEAR tape. For more information, please contact the Biological Safety Office at 352-392-1591.

UF ^{University of Florida} _{Health and Safety} _{University of Florida}

If your site generates **Biomedical** waste

- ▶ Must apply for a State generator's permit. See <http://www.doh.state.fl.us/environment/community/biomedical/index.html>
- ▶ Fill out & send form to your area (County) biowaste coordinator http://www.doh.state.fl.us/environment/community/biomedical/county_coordinator.htm
- ▶ A currently permitted generator that produces <25 lb per 30 days may claim an exemption from permitting requirements
 - Submit documentation from the previous 12 months showing <25 lb/30 days
- ▶ Yearly inspections by county biowaste coordinator (every 3 yrs for exempt facilities)
- ▶ No permit fee for state entity



Other state requirements for **Biomedical** waste generators



- ▶ Documented training – initial and annual refresher
- ▶ Written biomedical waste management plan http://www.doh.state.fl.us/environment/community/biomedical/pdfs/CurrentDisclaimer_08.pdf
- ▶ All biomedical waste pickup receipts
- ▶ Print & post a copy of the state regulations for biomedical waste 64E-16 F.A.C. <http://www.doh.state.fl.us/environment/community/biomedical/pdfs/64E16.pdf>
- ▶ Permits/exemptions on hand
- ▶ Keep all records for minimum 3 years

BMW Disposal Options



- ▶ Contract with a registered transporter, keep receipts
 - UF has contract with Stericycle
- ▶ Transport of <25 lb by a generator in their own STATE vehicle (to campus): exempt from transporter registration fees and vehicle placarding. **UF requires use of STATE VEHICLE only.**
 - Track on a transport log
- ▶ Some companies offer Sharps Disposal by Mail (e.g Waste Management) for small generators.
 - Must document waste moved this way. Keep your shipment records at least 3 years

Other biosafety issues at off-site locations...

- ▶ Select Agent use – contact Karen Gillis
- ▶ Shipping biologicals
- ▶ State & federal agricultural permits – import and interstate movement
- ▶ Exporting biological material
- ▶ Hoods, clean benches, biosafety cabinets
- ▶ Emergencies – spills/exposures
- ▶ Minors working in labs/greenhouses



Research project registration

<http://www.ehs.ufl.edu/programs/bio/forms/>



- ▶ **Recombinant DNA**
 - Use or creation of 1) recombinant nucleic acid molecules, 2) synthetic nucleic acid molecules 3) cells, organisms, and viruses containing such molecules
- ▶ **Biological Agent**
 - Human, animal or plant pathogens (BSL2 or 3)
 - Unknown human and animal pathogens
 - Primary human tumor cells
 - Cell lines immortalized with a virus (e.g. EBV, SV40, retrovirus)
 - Human blood, body fluids, or tissues known to be positive for human disease-causing agents
- ▶ **Acute Toxin**
 - Biological toxins with $LD_{50} \leq 100\mu\text{g/kg}$ body weight (e.g. ricin, tetrodotoxin, staph enterotoxins)

Questions?

- ▶ Contact the biosafety office:
 - bsa@ehs.ufl.edu , 352-392-1591

