



Biosafety Considerations for a Biohazardous Waste Management Program

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WARNING

The Following Presentation Contains
Graphic Images of Animal Carcasses
That Some May Find Disturbing

Viewer Discretion is Advised



Why Pay Attention to Medical Waste?





Overview

- Programmatic Issues
- Collection
- Transportation
- Disposal
- Training and Education
- Regulatory Compliance
- Waste Tracking



Programmatic Issues

- Institutional Responsibility
 - Environmental
 - Safety
 - Custodial
- Waste Definitions and Segregation Policy, e.g.:
 - Syringes
 - Pipettes
- Cost Recovery
 - Central overhead
 - "Pay as you go"



Waste Collection – Red Bags





Waste Collection - Sharps

- Sharps Containers
 - Autoclavable?
- Container Size & Location are **Critical**
 - Minimize handling of used sharps
- Avoid Overfilling
- Cautions:
 - Container substitution
 - Container reuse





Notes on Waste Containers

- Reusable Containers
 - Sharps
 - Red bag bins
- Location of Containers at Biosafety Cabinets
 - Minimize hand movement in/out of BSC
 - Decrease contamination potential
- Central Supply of Containers



Animal Waste

- Waste type
 - Carcasses
 - Bedding, etc
- Species
- Containers





Special Cases

- Pharmaceutical & Chemotherapy waste
 - Note differences between bulk chemicals and medical waste items contaminated with chemo agents
 - Medical waste contaminated with similar chemical agents (e.g., ethidium bromide)
- Other Mixed Wastes
- Mammalian Cell Culture Waste



Special Cases, ctd.

- BSL-3 Waste
 - Pass-through Autoclave in lab is common design approach
 - Suites of labs – central autoclave in suite
 - Autoclave outside of BSL-3:
 - Double-bagging at containment barrier
 - Transportation in closed cart



Waste Transportation

- Indoor
 - Enclosed vs. open carts
 - Rubber wheels!
- Outdoor (public roads)
 - Permitted vehicle
 - Shipping containers





Carcass Waste Transportation





Notes on Waste Transportation

- USDOT Hazmat Transportation Regulations Apply:
 - Container specifications, marking, labeling
 - Training Required:
 - Personnel who transport the containers
 - Personnel who *pack* the containers
- **Reusable Waste Containers are often themselves shipping containers**



Waste Disposal

- Several available technologies
- Critical Issues:
 - Well-engineered system
 - Consider environmental impacts, especially odors
 - Have several downstream disposal options





Intermediate vs. Final Treatment

- **Intermediate Treatment**
 - Usually performed for worker protection
 - Autoclaving most common method
 - Standard microbiology lab practice
 - Performed before transport to final treatment
- **Final Treatment**
 - Much more effort involved
 - Permitting
 - Monitoring
 - Recordkeeping
 - Reporting
 - Risk Management
 - Two options:
 - On-site treatment by facility staff
 - Off-site treatment by disposal contractor



Waste Treatment Options

- Cradle-to-grave responsibility applies
- Do it yourself ...
 - Standard practice for liquids
 - Autoclaves and other solid waste treatment devices generally require permitting, usually by local entity
 - Shredding probably required
- Have someone else do it ...
 - Very common, few contractors
 - Less liability but requires due diligence
 - Likely lower cost option unless quantities are large
 - Require your transporter to:
 - generate manifest of types and amounts of MW transported
 - provide certificate of destruction

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Liquid Waste Disposal

- Drain Disposal (*Sanitary Sewer*)
- Autoclave following *validated* procedures
- Chemical inactivation
- Use Engineered Treatment System
 - In-lab
 - In-building





Notes on Waste Disposal

- Shipping RMW = waste *handling*
 - Spills, releases
 - Injuries
- Treating RMW onsite = better pandemic preparedness
- RMW treatment systems typically include both decontamination and grinding
 - Decontamination first makes grinder repairs safer
- Some carcass waste treatment systems require sectioning of large carcasses



Notes on Waste Disposal, ctd.

- Automated cart dumpers minimize waste handling & associated injury risks





Training and Education

Item	Quantity	Location	Responsible Person	Date	Notes
1. 100% of all sharps					
2. 100% of all sharps					
3. 100% of all sharps					
4. 100% of all sharps					
5. 100% of all sharps					
6. 100% of all sharps					
7. 100% of all sharps					
8. 100% of all sharps					
9. 100% of all sharps					
10. 100% of all sharps					





Regulatory Compliance

- Know the agencies, laws, & regulations that apply
- Work closely with regulators involved
- Consider permits carefully
- Keep good records
- Use IT tools to support reporting

A screenshot of a regulatory compliance form. It includes a header with 'Cornell University' and 'Highland Engineering LLC'. The form contains several sections with checkboxes for different regulatory requirements, such as 'RCRA', 'EPCRA', 'SDWA', and 'CERCLA'. There are also fields for dates and signatures.



Waste Tracking System



A barcode with the number 003326. Below the barcode, the following information is printed: 2/1/2005, Tech, John D., 253-3337, AHDL-BSE Testin, RMW-Red Bag.

- Compliance
- Cost Recovery
- Chain of Custody
- Safety

A form titled 'Cornell College of Veterinary Medicine Medical Waste Tracking System Waste Tracking Tag'. It includes a barcode and fields for 'Your Name', 'Phone', 'Code', 'Department', and 'Section/PT'. There are checkboxes for 'Waste Information: source req', 'RMW - red bag', 'RMW - sharps container', 'biohazard', 'infected carcass disposal', 'other carcasses or tissue waste', and 'other (provide text)'. There are also checkboxes for 'carcass - private destination', 'other private source', 'Client name', and 'Recycling facility? Yes/ No (use only if Client Requested from Recipient)'. A 'Comments' field is at the bottom.
