



Biological Waste Disposal

Student Guide

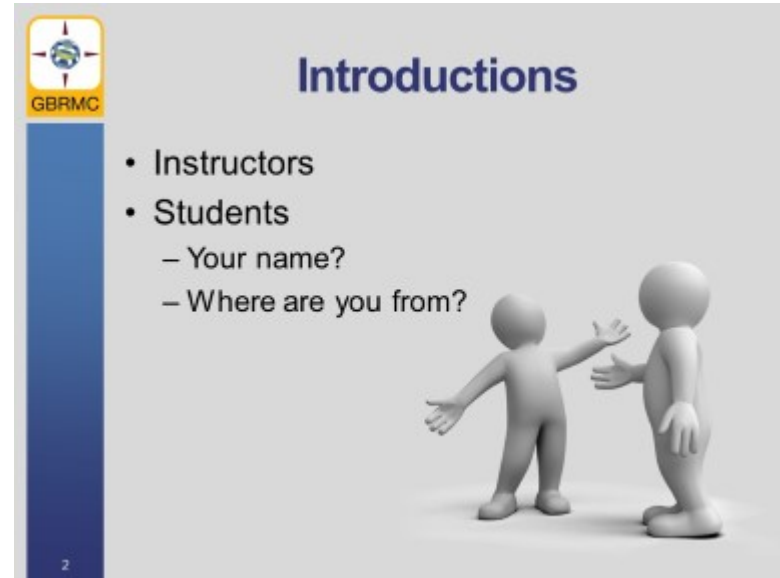
2012



GLOBAL BIORISK MANAGEMENT CURRICULUM

Biological Waste Disposal

Welcome & Introductions



Action Plan

By the end of this lesson, I would like to:

KNOW		FEEL		BE ABLE TO DO	
<i>Your learning doesn't stop with this lesson. Use this space to think about what else you need to do or learn to put the information from this lesson into practice.</i>					
What more do I need to know or do?		How will I acquire the knowledge or skills?		How will I know that I've succeeded?	How will I use this new learning in my job?

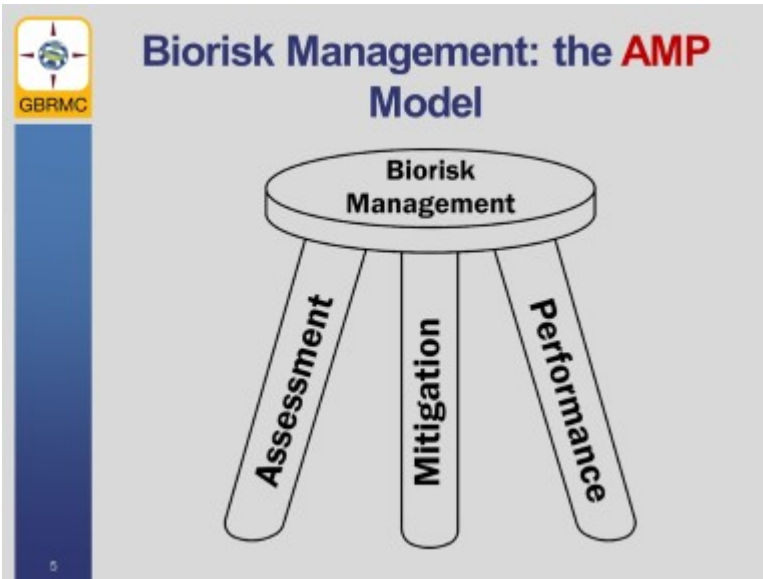



Key Messages

- Waste should be segregated into appropriate waste types, according to the risk it presents.
- Different methods for collection and storage of biological waste are necessary for different types of waste.
- There are different treatment methods that are appropriate according to the risk the waste type presents.
- Although legal requirements vary according to location, the basic principles of biological waste disposal and treatment remain the same due to the risk associate with each waste type.

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Do you have personal objectives you would like to accomplish?
If so, jot them down!



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- Key Components of Biorisk Management**
- **Biorisk Assessment**
 - Process of identifying the hazards and evaluating the risks associated with biological agents and toxins, taking into account the adequacy of any existing controls, and deciding whether or not the risks are acceptable
- 



Key Components of Biorisk Management

- **Biorisk Mitigation**
 - Actions and control measures that are put into place to reduce or eliminate the risks associated with biological agents and toxins



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Key Components of Biorisk Management

- **Biorisk Performance**
 - Improving biorisk management by recording, measuring, and evaluating organizational actions and outcomes to reduce biorisk.



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Biological Waste Disposal

What is biological waste?



What IS biological waste?

Small Group Discussion, Part 1:

- What can be considered **biological waste**?
- Think of as many examples as you can and write each example on a single **sticky note**.
- You have **5 minutes**.



What definition of biological waste did you use to complete this exercise?

What materials did you consider biological waste?

Biological Waste Disposal

What is biological waste?



Categories of Biological Waste

- Solid waste (non-sharp)
- Sharps
- Pathological Waste
- Liquid Waste
- Mixed Waste



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Who Defines Biological Waste?

- Countries, States (Regulatory Agencies)
 - Laws
 - Regulations
 - Guidance
- Institutions
 - Policies

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Biological Waste Disposal

What is biological waste?



What IS biological waste?

Class Exercise, Part 2:

- Distribute the **sticky notes** with examples of **biological waste** to each of your group members.
- Post each **sticky note** on the **flip chart** with the category of waste it fits under.
- You have **5 minutes**.

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What were your categories?

How and why did you choose these?

How does a sensible categorization process aid disposal management processes?

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What is biological waste?



Why pay attention to waste?

Reflection and Class Discussion:

- Who is at **increased risk** if waste materials contaminated with biological materials are not handled and treated properly?
- What are **potential incidents** that can occur?

Complete the template in your **workbook** and then discuss with the class.

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Who is put at risk if contaminated waste materials are handled improperly?

List some potential incidents that may occur:

Biological Waste Disposal

What is biological waste?



Why pay attention to waste?

Small Group Exercise:

Each group will be assigned one category of waste.

- Look at the examples of waste under each category and also your list of increased risks from improperly handled and untreated waste.
- **Develop a process to mitigate the risk** from this category of waste materials. A flow chart is a good way to visualize a process.

Write or draw your process in your **workbook** and also on your **flipchart**.

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List some mitigation options:



Steps in Waste Management

- Segregation
- Collection
- Storage
- Transport
- Treatment
- Final Disposal



Look at your process. Are all these components included? If not, add them into your process.

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Steps in Biological Waste Management

Sharps Waste Collection



- Sharps Containers
 - Closable and when closed not reopenable
 - Autoclavable?
- Container Size & Location are Critical
 - Minimize handling of used sharps
- Avoid Overfilling
- Cautions:
 - Container substitution
 - Container reuse



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Steps in Biological Waste Management



Why does the nature of the waste material dictate the type of storage?


How might transport requirements for waste differ depending on where and how long the transport occurs?



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 biowaste transported
 - provide certificate of destruction


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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

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 **Treatment Technologies**

- Autoclave
- Incineration
- Chemical treatment
- Microwave
- Alternative technologies
 - irradiation
 - high-temp pyrolysis (vitrification)
 - macrowave
 - others



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 **Treated Biological Waste**

- Biological solid waste that has been treated by an acceptable method is considered non-contaminated and non-hazardous; the liquid can be sewer-disposed and the solids put in sanitary landfills.
- Most localities require that decontaminated medical waste (especially sharps) be made unrecognizable before being landfilled. A shredding step must be included after treatment.



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Treatment Options



What is pathological waste treatment?

List some factors that can change pathological waste treatment:



Liquid Waste Treatment

- Drain Disposal (Sanitary Sewer)
- Autoclave following validated procedures
- Chemical inactivation (e.g. 10% Chlorine Bleach overnight before drain disposal)
- Use Engineered Treatment System
 - Onsite
 - Offsite



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Remember to beware of autoclaving liquids!!

Why? What kind of hazard(s) does that create?



Why pay attention to waste?

Small Group Exercise:

- Look back at the process your group designed for management of the biological waste type you were assigned.
- Based on group and class discussion, as well as the additional information just presented, do you have any changes to your process?
- **Finalize your process and present it to the group.**

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Review



Review of Biological Waste Disposal

To wrap-up, let's discuss what we learned about **Biological Waste Disposal**.

What did we learn?	What does it mean?	Where do we go from here?
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What did you learn?

What does it mean?

How can/will you apply it?



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Use space on back, if needed