

# NETEC

National Ebola Training  
& Education Center

# Waste Management



## Module 5



EMORY  
MEDICINE

University of Nebraska  
Medical Center



Nebraska  
Medicine

HHC NEW YORK CITY  
HEALTH AND  
HOSPITALS  
CORPORATION  **Bellevue**  
SOUTH MANHATTAN HEALTHCARE NETWORK

*Funded by ASPR & CDC*

# LEARNING OBJECTIVES

- Understand requirements for Category A infectious substance waste management, transport, and disposal
- Know steps for:
  - Primary packaging medical waste for offsite inactivation or onsite autoclave
  - Secondary packaging and removal of waste
- Understand guidance and know procedures for handling liquid waste
- Understand that:
  - Ebola-associated waste is not infectious after appropriate incineration or autoclave treatment
  - Therefore additional protection/prevention measures do not reduce the risk of infection

## BACKGROUND

- Category A infectious substance
  - Medical waste contaminated or suspected to be contaminated with Ebola virus is a Category A infectious substance
  - Regulated as a hazardous material under the U.S. Department of Transportation's Hazardous Materials Regulations (HMR; 49 CFR, Parts 171- 180)
  
- Facilities should have a waste management plan and protocols in place for:
  - Packaging and transporting waste contaminated with Ebola virus in accordance with DOT regulations
  - Inactivating contaminated waste onsite at the hospital or having it transported offsite for inactivation

# SEQUESTERING MEDICAL WASTE

- During initial assessment, hospitals may consider sequestering medical waste until the patient's Ebola test result becomes known
- Example:
  - Use adjacent vacant patient room as waste holding room
  - Place 2-3 large (approx. 6 ft. x 6 ft. x 3 ft.) wheeled linen carts in waste holding room
  - Line each cart with a large plastic cart liner and absorbent material
  - Double-bag solid waste from care of PUI using same procedures as for confirmed Ebola patient
  - Place bags in lined carts in waste holding room until definite decision on Ebola diagnosis



# SEQUESTERING MEDICAL WASTE

- If Ebola is ruled out - Waste can be handled according to procedures in compliance with local waste management ordinances
- If Ebola diagnosis is confirmed -Follow procedures for Ebola waste management

# INACTIVATION OF EBOLA- ASSOCIATED WASTE

- Regulations - Inactivation or incineration of Ebola-associated waste within a hospital system may be subject to state, local and OSHA regulations
- Onsite/offsite inactivation - Determine whether Ebola-associated waste will be inactivated onsite at the hospital or transported offsite for inactivation
- Methods for inactivation of Ebola-associated waste
  - Autoclave
  - Incineration

# TIPS FOR ONSITE AUTOCLAVING

- Waste bags should not be filled completely
  - Full bag makes it difficult for HCW to manage waste safely
  - Often a full bag will not fit into the autoclave
  
- Work through autoclave validation steps with State and Local Health Department and waste handling vendor
  - Biological Indicators
  - Chemical Indicators
  - Physical Records

# TIPS FOR ONSITE AUTOCLAVING

- **Predetermine**
  - Logic model for moving waste from holding area to autoclave
  - PPE for autoclaving
  - Training and competency for those who will run autoclave
- **Operators**
  - Make sure autoclave operator and waste handlers are well-trained and volunteered for this duty
- **Waste holding**
  - Identify a waste holding area and strategy in case you get backed up on autoclaving or in case your autoclave goes down



# INACTIVATION OF EBOLA- ASSOCIATED WASTE: INCINERATION

- Incineration
  - Ebola-associated waste may be incinerated.
  - Incineration products (i.e., the ash) can be transported and disposed according to state and local regulations and standard protocols for hospital waste disposal.
- Certified contractor accepts to pick up waste
  - Specific boxes
  - Designated days
  - Waste tracking manifests
  - Certification of waste final disposal



# PRIMARY PACKAGING OF SOLID MEDICAL WASTE

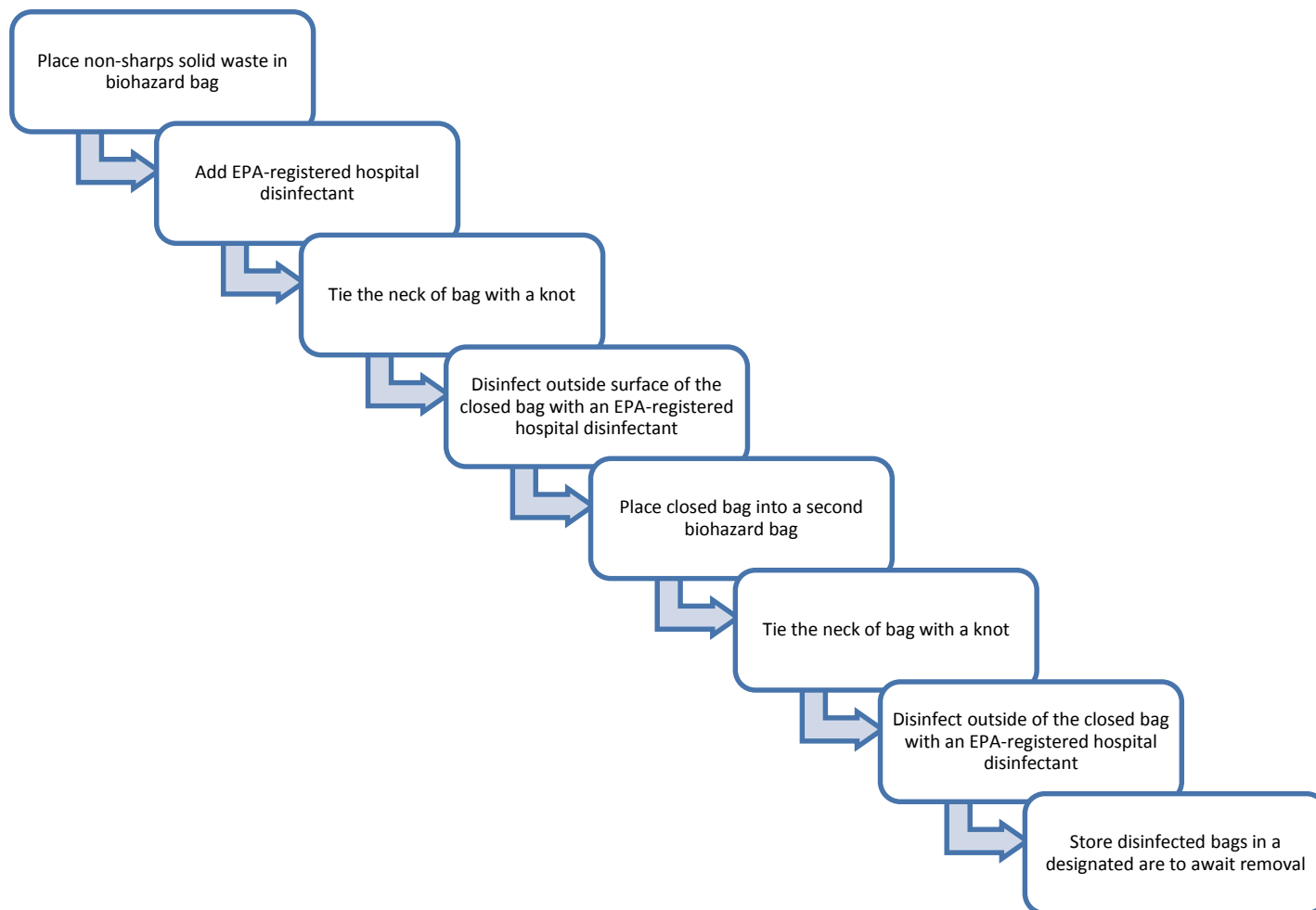
- Should take place in the patient's room or where waste is generated
- Should be performed by Ebola patient care staff wearing appropriate PPE
- Sharps waste should be carefully placed in appropriate disposable sharps container
- Solid waste should be collected in leak-proof biohazard bags
- Each bag should be disinfected with an EPA-registered hospital disinfectant before being removed from the patient's room, as required by the DOT Special Permit-16279

# PRIMARY PACKAGING OF SOLID MEDICAL WASTE

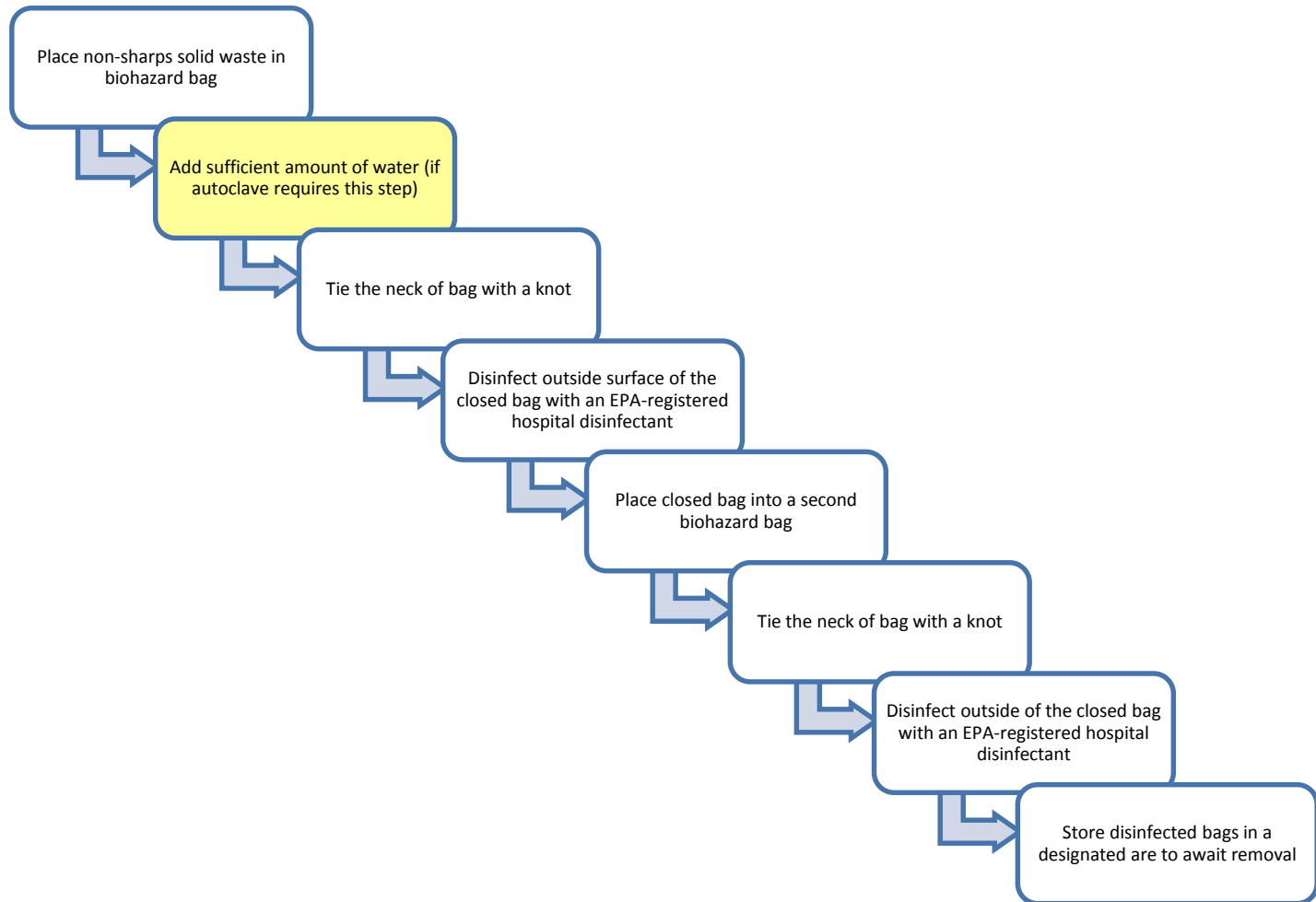
- Biohazard bags and sharps containers **SHOULD NOT** be compressed or filled beyond 2/3 full to allow for safe closure
- Waste bags **MUST** be able to fit into onsite autoclave or a 55-gallon cardboard containers for offsite inactivation
  - One facility overfilled biohazard bags. Bags were too big to fit into the 55-gallon cardboard containers
  - Later, workers had to open the biohazard bags to re-allocate waste into smaller bags



## PRIMARY PACKAGING OF MEDICAL WASTE: STEPS FOR OFFSITE AUTOCLAVE



## PRIMARY PACKAGING OF MEDICAL WASTE: STEPS FOR OFFSITE AUTOCLAVE



# TIPS FOR PRIMARY PACKAGING OF WASTE

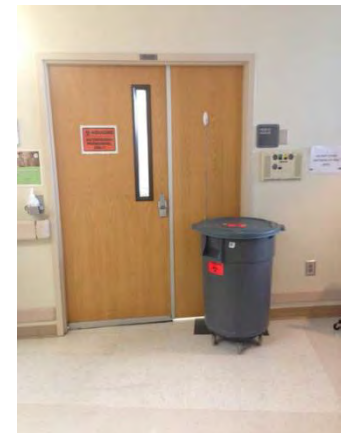
- Don't over-pack bags
- Purchase cheap and easily cleaned waste containers to be placed into your unit
  - If you size them appropriately they can help control the amount of waste going into the bags to prevent over-packing
- Replace all waste bags in your unit with either the biohazard bags or autoclave bags that you use
  - If only one type bag is used, this prevents putting a non autoclave-safe bag in the autoclave
  - Helps control size of waste and prevents overloading a bag
- Some facilities have chosen to place primary biohazard bag in a linen receptacle to collect solid waste (may make it easier to disinfect the outside of the bag)

# SECONDARY PACKAGING AND REMOVAL OF WASTE

- Double-bagged waste should be placed in a designated transport cart for onsite inactivation OR placed in a rigid outer receptacle with absorbent material and liner for offsite inactivation
- Environmental services personnel handling waste should never open the container or handle the double bagged waste

## WASTE MANAGEMENT AT EMORY

- Solid waste collected in patient room:
  - Solid waste is collected in red biohazardous waste bag. The bag should not be more than HALF FULL.
  - Bag is wiped down with bleach wipes and placed in another red biohazardous waste bag.
- Solid waste in ante room:
  - Bags of solid waste coming out of the patient room are immediately placed into an autoclave bag and secured
  - Bag is then placed in roller drum located directly outside of the anteroom





# AUTOCLAVE VALIDATION

## ➤ Tracking waste from Emory to Stericycle



### TRACKING OF AUTOCLAVED WASTE FROM EMORY UNIVERSITY TO STERICYCLE

(HIGH CONTAINMENT SUITE)

Autoclave and Validation Date	Autoclave Load #	BOX #	Stericycle Bar Code #	Date Handed Over
Example: 8-3-14	25853	1	XYZ	8-4-14

\_\_\_\_\_  
Signature of Responsible Person  
Emory University  
Contact Phone #

\_\_\_\_\_  
Signature of Responsible Person  
Stericycle  
Contact Phone #

# AUTOCLAVE VALIDATION DOCUMENTATION

EMORY HEALTHCARE  
 DEPARTMENT OF AUTOCLAVE VALIDATION/EMORY UNIVERSITY'S STERILIZATION  
 (SEE INSTRUCTIONS ATTACHED TO THIS)

Autoclave and Validation Date	Container Label #	BOX #	Sterilize Box Label #	Date Sterilized Cycle
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8/27/14	21313	1/1	2012	8/27/14
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8/27/14	21398	1/1	2012	8/27/14
8/27/14	21399	1/1	2012	8/27/14
8/27/14	21400	1/1	2012	8/27/14

Signature of Responsible Person: *[Signature]*  
 Emory University  
 Contact Phone # 404-710-3661

Signature of Responsible Person: *[Signature]*  
 Stericycle  
 Contact Phone # 770-686-4641

Autoclave Validation Document - Best Practice at Emory

**Stericycle**  
 Protecting People. Reducing Risk.

**Generator Certification of Pre-Treatment**  
 Ebola Virus Disease (EVD) (formerly known as Ebola hemorrhagic fever (Ehola HF))

**Generator Certification:**

This is to certify that all container (s) containing (EVD) or Ebola HF waste materials have been pre-treated by the attached method as described and recommended by the Center for Disease Control (CDC). This is to also certify that the container(s) are properly classified, described, packaged, marked, labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation as a regulated medical waste. This waste offload to Stericycle is appropriately marked for disposal via incineration.

Each box has been prepared with 2 liners provided by Stericycle properly gusseted (if) and the containers have been properly closed per the closing instructions provided.

**PLEASE PROVIDE THIS DOCUMENTATION PRIOR TO SHIPMENT - This document shall accompany each shipping document prepared and shipped as regulated medical waste for incineration.**

(Please enter in space provided containing attachments)  
 Written pre-treatment protocol as per the CDC instructions:  
 Most recent efficacy testing protocol & results for Auto Clave(s) challenges testing used for Pre-Treatment:

Total number of containers prepared for shipment: 34 Date of Shipment: 8-8-2014

*Brian Foster, DHEUS*  
 Printed Name/Title  
 Hospital/Generator

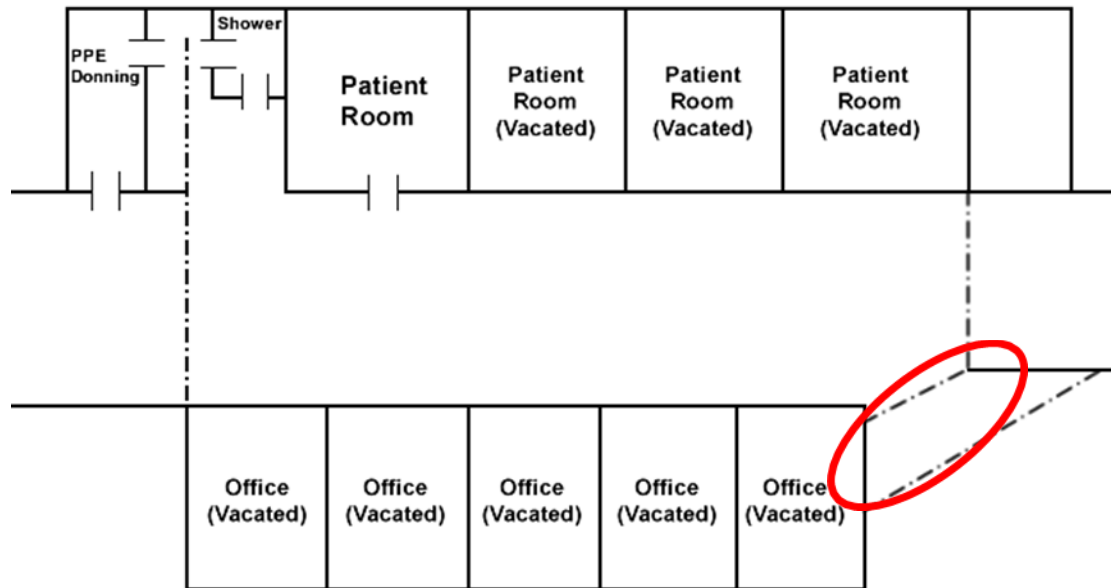
*[Signature]*  
 Signature  
 Date: 8-8-2014

August 2014

**Documentation is key!**

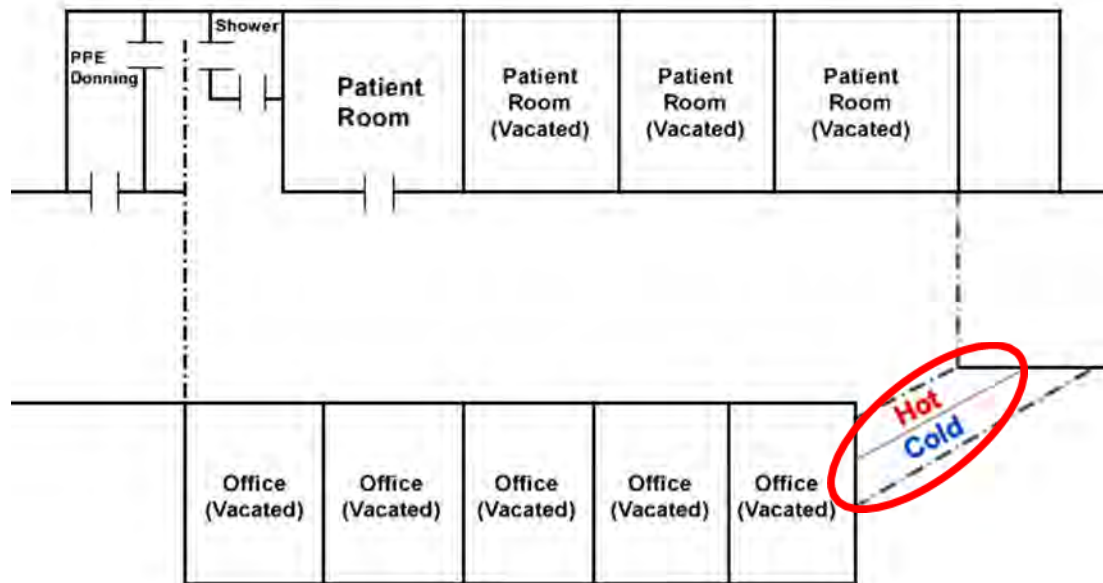
## EXAMPLE OF SECONDARY PACKAGING AND REMOVAL OF WASTE

- One facility erected a trash anteroom by adding a second zippered well



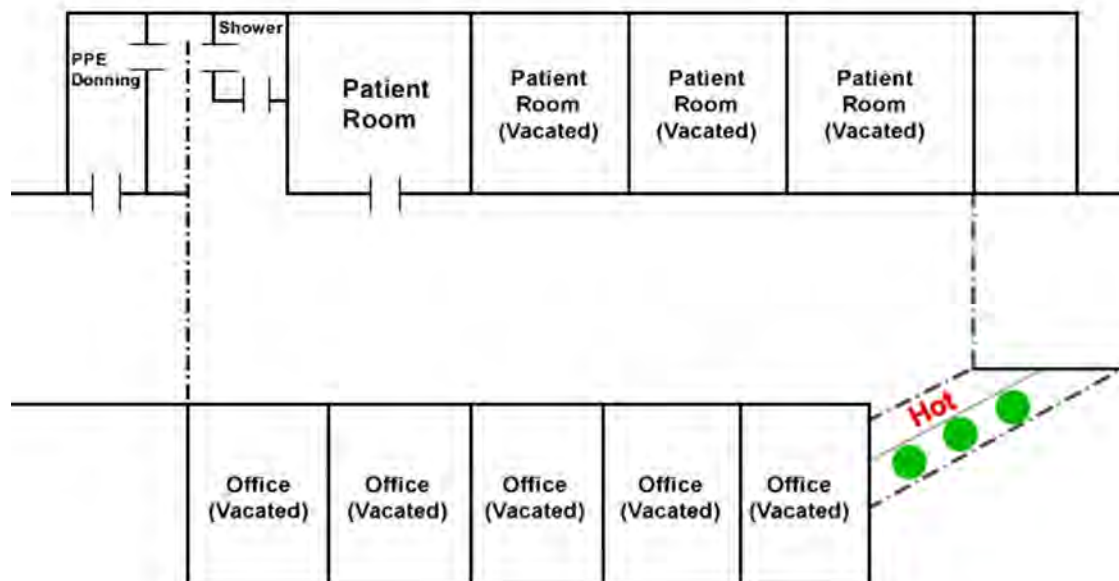
# EXAMPLE OF SECONDARY PACKAGING AND REMOVAL OF WASTE

- Trash anteroom was divided into a “Hot” and “Cold” side



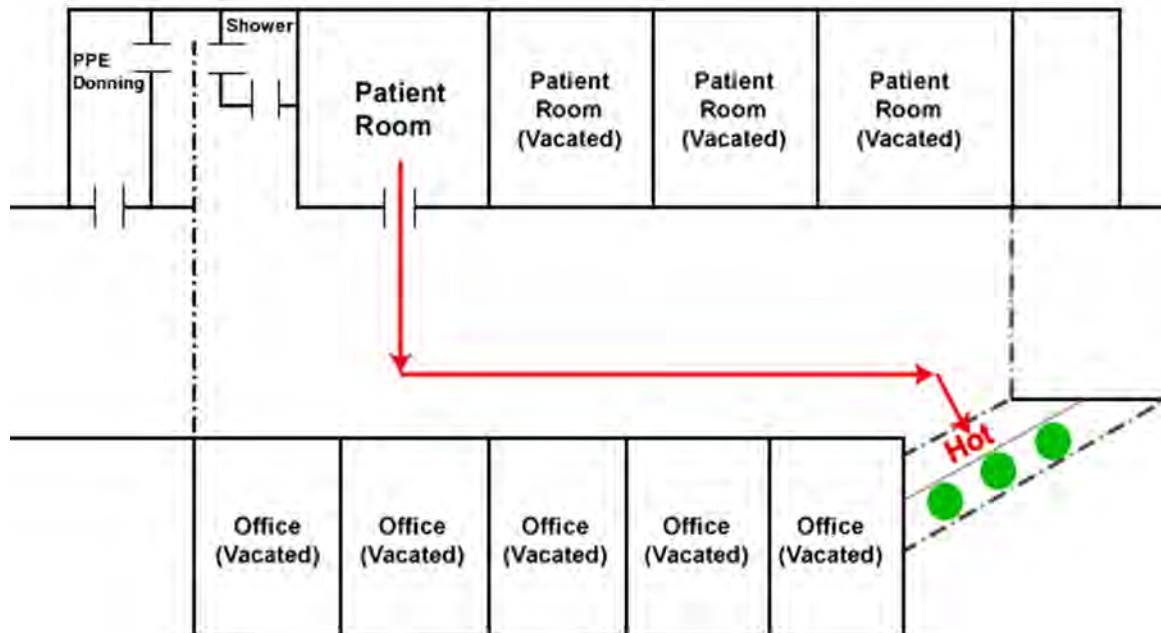
# EXAMPLE OF SECONDARY PACKAGING AND REMOVAL OF WASTE

- Once per day, EVS would open their side of the zippered wall and place empty 55- gallon DOT-approved Category A lined cardboard drums on the “cold zone” section of trash anteroom



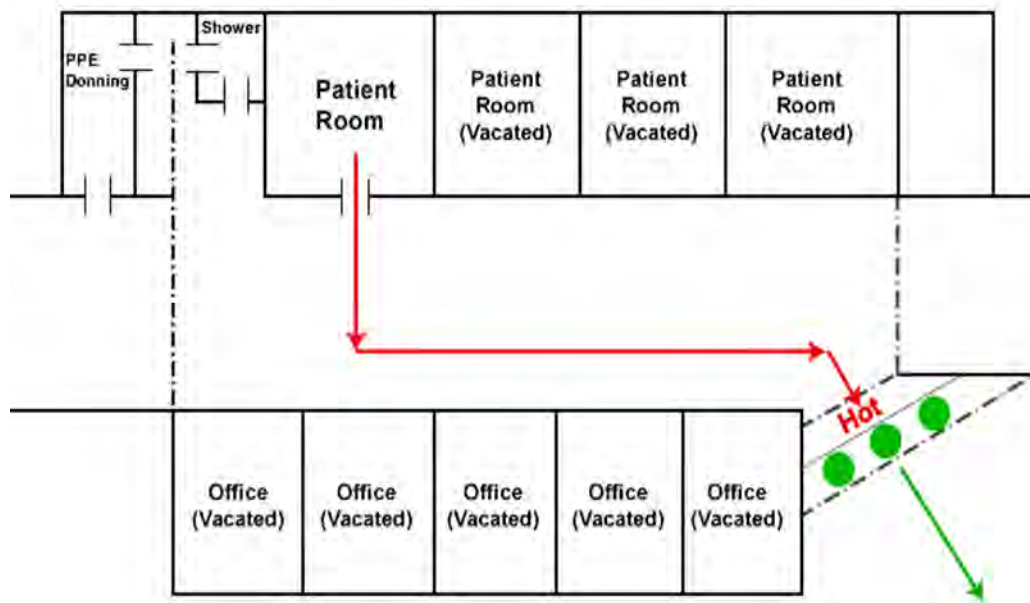
# EXAMPLE OF SECONDARY PACKAGING AND REMOVAL OF WASTE

- Nurses in the hot zone would bring double-bagged medical waste directly to the trash anteroom, place it inside the cardboard drums, zip-tie the plastic liner, and seal the drums when they were full



# EXAMPLE OF SECONDARY PACKAGING AND REMOVAL OF WASTE

- EVS staff would remove the full drums from the waste anteroom and transport them to a loading dock where they were temporarily stored awaiting pick up by the vendor
- Hot area was cleaned and disinfected by nursing staff; cold area by EVS staff



# HANDLING OF LIQUID WASTE

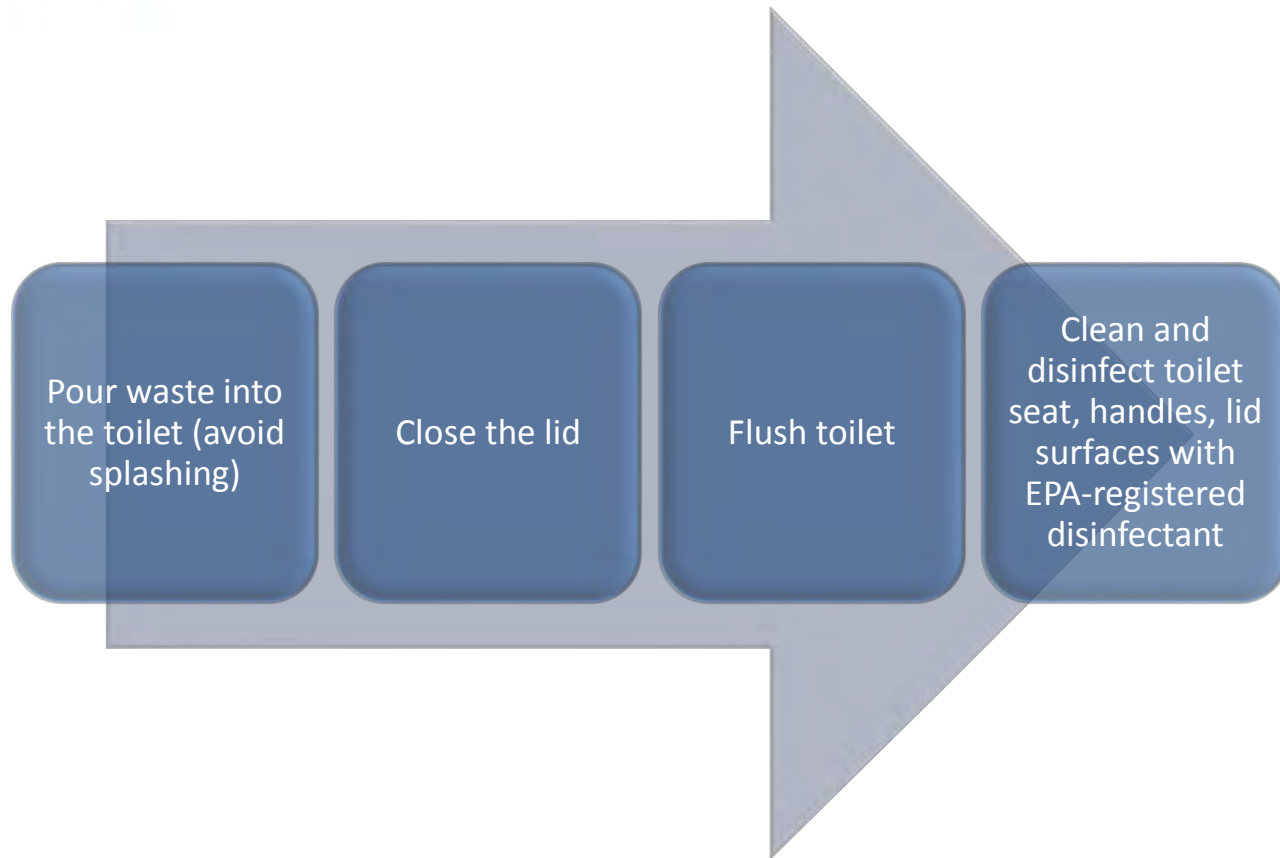
- Primary handling of liquid waste should occur in the patient's room and be performed by the primary healthcare workers
- Protocols should be in place for disposal of liquid waste that incorporate state and local regulations on pretreatment
- CDC guidance does not require pretreatment
- If state or local regulations require pretreatment, use a chemical that does not pose a respiratory risk to the patient or staff



# HANDLING OF LIQUID WASTE

- CDC guidance does not require disinfecting patient waste in the toilet
  - No published data on the effectiveness of disinfectants against viruses in human waste
  - No EPA-registered disinfectant approved for use against enveloped or non enveloped viruses in feces, urine, or vomit in the toilet before their disposal in a sanitary sewer system
  - Viruses will associate with particles and organic matter in patient waste and thereby decrease the effectiveness of disinfectants

## CDC RECOMMENDED GUIDANCE FOR HANDLING LIQUID WASTE



# EMORY PROCEDURE FOR HANDLING LIQUID WASTE

- For ambulatory patient using restroom:
  - Place 350mL of disinfectant (ratio of 200 mL of disinfectant and 400 mL of water) into toilet after each use—water will turn yellow
  - Place half hat on seat ready for next use, if applicable
  - After toileting, empty specimen into toilet, close lid, then flush x 2
  - Discard half hat in CLOSED trash can.
  - Place 350mL of disinfectant (ratio of 200 mL of disinfectant and 400 mL of water) into toilet.
  - Wipe down toilet seat and toilet handle with bleach wipe
- Note: This procedure was selected based on negotiations with local utilities company that insisted on pretreatment and had expressed significant fears among their workers.


# EMORY PROCEDURE FOR HANDLING LIQUID WASTE

- For non-ambulatory patients using bedside commode:
  - Place 100mL of disinfectant (ratio of 200 mL of disinfectant and 400 mL of water) into bucket prior to use
  - After use, measure total output
  - Open and add one packet of solidifier to bucket
  - Once solidified, discard bucket in CLOSED trashcan located in restroom
  - Wipe down bedside commode with bleach wipe
  - Replace with new bucket
  - Add 100mL of disinfectant (ratio of 200 mL of disinfectant and 400 mL of water) to bucket for next use

# NEBRASKA MEDICAL CENTER PROCEDURE FOR HANDLING LIQUID WASTE



- Place waste into the toilet (avoid splashing)



- Add the hospital grade disinfectant at manufacturer-recommended ratio



- Close the lid



- Hold for 2.5x recommended contact time



- Clean and disinfect flush handles, toilet seat, lid surfaces with EPA-registered disinfectant

# BELLEVUE PROCEDURE FOR HANDLING LIQUID WASTE

- Add household bleach 5% as follows:
  - $\frac{3}{4}$  cup to each liter of liquid in bowl, or  $2\frac{1}{2}$  cups to each gallon of liquid in bowl
- Close cover or lid
- Wait 20 minutes before flushing

# BELLEVUE PROCEDURE FOR HANDLING LIQUID WASTE

## ➤ Precautions

- Bleach is a strong corrosive. Use rubber gloves and goggles to protect skin and eyes from contact with bleach
- Do not use other cleaning products at same time in toilet bowl. Chemical reactions can occur causing harmful vapors
- Use in a well-ventilated area
- Guard against splashing
- Follow safety guidelines outlined in OSHA's Fact Sheet, Cleaning and Decontamination of Ebola on Surfaces ([https://www.osha.gov/Publications/IOSHA\\_FS-3756.pdf](https://www.osha.gov/Publications/IOSHA_FS-3756.pdf))

## TIPS: LIQUID WASTE MANAGEMENT

- Some facilities who do not have patient toilets in the patient room have used a covered bedside commode
- To minimize the risk of spills when using a bedside commode, some facilities have elected to add solidifier to the commode contents and dispose of it as solid waste
- Consider use of a bowel management system for patients who are unstable, have altered mental status, or are unable to ambulate safely to the commode





# LESSONS LEARNED ABOUT WASTE MANAGEMENT

- There will be a lot more waste than you anticipate
- Be proactive, start communication with all who will be involved
  - Build your partnerships now
    - Local authorities
    - Your biomedical waste vendors

# LESSONS LEARNED ABOUT WASTE MANAGEMENT

- Be very systematic
- Think sustainable
  - Have a plan, a back up and a back up to the back up
  - AND test the plan
- Know the rules, regulations and guidelines
- If you have access to Biorisk Management Professionals, involve them in the process.
- Document everything

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