Location, Location, Location! Environmental Services And Labs/Pathology/Mortuary

Kalpana Rengarajan, PhD, MPH, JM, RBP
Director Research Safety / Biosafety Officer
Environmental Health and Safety Office
Office of Research Administration
Emory University

Disclosures

- Nothing to disclose

SHEA/CDC OUTBREAK RESPONSE TRAINING PROGRAM
© SHEA 2018

Learning Objectives

- Formulate effective strategies to protect healthcare providers and staff
- Identify unique challenges to infection control in each setting

Specific Protocols for Solid Waste Management

- Anteroom
- Patient room
- End of shift
- Spill clean up
- Moving waste from patient room to autoclave

Solid Waste Management

In patient room:

- Solid waste is collected in red biohazardous waste bag; the bag should not be more than HALF FULL
- 200 mL to 300 mL of water inside the bag; tie the bag closed
- Bag is wiped down with bleach wipes and disposed in waste bag
- Bag is placed in another red biohazardous waste bag; tie the bag closed
- Second bag is wiped down with bleach wipes
- Bag is transferred into the anteroom

Solid Waste Management (cont.)

In the anteroom:

- Bags of solid waste coming out of the patient room are immediately placed into an autoclave bag and secured
- Bag is wiped down with bleach wipes
- Bag is then placed in roller drum located directly outside of the anteroom
- Roller drum is then moved to staging area or the autoclave room as appropriate
- A new empty roller drum is then placed outside the anteroom
- Roller drums are wiped down once bags are removed for autoclaving

Solid Waste Management (cont.)

Autoclave:

- Bags are placed in the autoclave
- A 3M ATTEST test pack is used with every run
- Autoclave is run on the GRAVITY setting (1 hour)

Solid Waste Management (cont.)

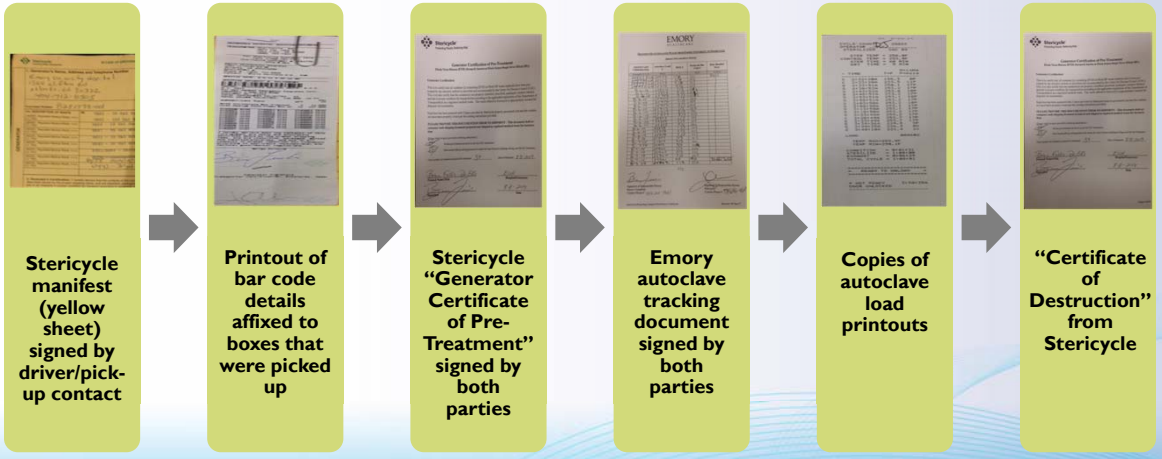
Unloading the Autoclave:

- Once autoclave cycle is complete and has cooled, waste bags are removed and placed in a lined Regulated Medical Waste box
- 3M test pack is analyzed.
- All runs are validated and documented

Solid Waste Management (cont.)

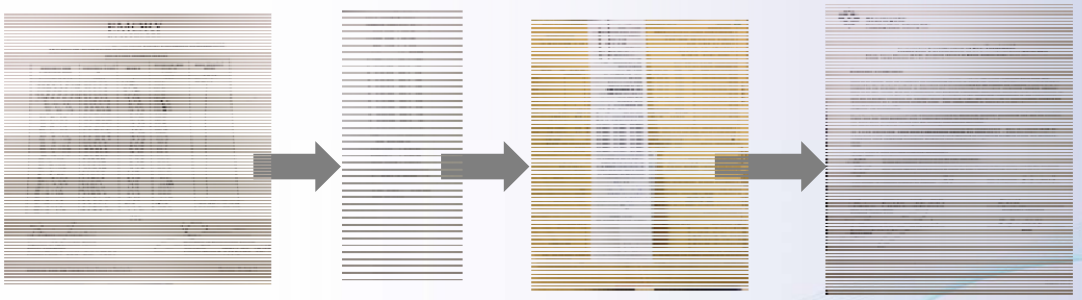
- The boxes picked up weekly or as needed by a dedicated truck and transported as regulated medical waste for incineration

Autoclave Validation



Solid Waste Management

Documentation is key!



Liquid Waste Management

- **All liquid waste materials are pre-treated before disposal**
  - Commode was pretreated with MicroChem (for final concentration of 5%)
  - If patient is nonambulatory, bedside/autoclavable commode pretreated with MicroChem was used; solidifier was then added before disposal by solid waste disposal waste stream
  - If patient used a bag for vomitus, solidifier added to bag and then disposed by solid waste disposal process

Facility Decon

Patient Room Example:

- Personnel don with complete PPE
- Patient belongings to be gathered and placed on the bed
- All surfaces, drawers, bathrooms to be wiped with microchem
- Equipment to be wiped according to manufacturer's instruction
- Waste is double bagged, wiped, and handed over to anteroom personnel
- Anteroom personnel place the waste in autoclave bag, tie, and place in the waste drum in hallway
- Room is then ready for VHP decontamination

CDC Guidance for Safe Handling of Human Remains of Ebola Patients in US Hospitals and Mortuaries

According to CDC Guidelines:

- The body should be wrapped in a plastic shroud and placed in a leak-proof bag, then placed in another leak-proof bag
- Care for potential contamination and disinfection at every point along the way
- The CDC does not recommend embalming or washing the body
- Remains should not be removed from the bags
- Remains should be cremated or buried promptly in a hermetically sealed casket
- **See CDC Web site for detailed guidance**

www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html

Be Prepared

Minimum supplies consist of the following:

1. 50 Stericycle boxes
2. 3 cases of red bags
3. 1 case of autoclave bags
4. 1 bag of autoclave bag rubber bands
5. 1 incubator
6. 1 case spore testing pack
7. 2 cart covers
8. 1 spill kit
9. 1 pair heat-resistant gloves
10. Policies and procedures
11. 2 binders (1) autoclave (1) waste packaging
12. 12 Rubbermaid® barrels with lids and casters

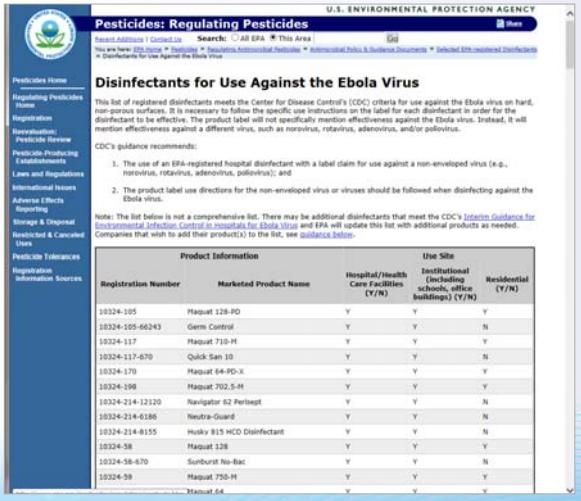
After patient has been discharged, clean supplies are shrink-wrapped and sent to our offsite distribution center

Regulations, Guidelines, and Recommendations Related to Waste Management

- CDC Guidelines for Ebola in Healthcare Workers and Settings
- DOT Hazardous Materials Regulations (Division 6.2 Biological Agents)
- Georgia EPD

SHEA/CDC OUTBREAK RESPONSE TRAINING PROGRAM
© SHEA 2018

Appropriate Disinfectants



U.S. ENVIRONMENTAL PROTECTION AGENCY

Pesticides: Regulating Pesticides

Disinfectants for Use Against the Ebola Virus

This list of registered disinfectants meets the Center for Disease Control's (CDC) criteria for use against the Ebola virus on hard, non-porous surfaces. It is necessary to follow the specific use instructions on the label for each disinfectant in order for the disinfectant to be effective. The product label will not specifically mention effectiveness against the Ebola virus. Instead, it will mention effectiveness against a different virus, such as norovirus, rotavirus, adenovirus, and/or poliovirus.

CDC's guidance recommends:

1. The use of an EPA-registered hospital disinfectant with a label claim for use against a non-enveloped virus (e.g., norovirus, rotavirus, adenovirus, poliovirus); and
2. The product label use directions for the non-enveloped virus or viruses should be followed when disinfecting against the Ebola virus.

Note: The list below is not a comprehensive list. There may be additional disinfectants that meet the CDC's Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus and EPA will update this list with additional products as needed. Companies that wish to add their product(s) to the list, see guidance below.

Product Information		Use Site		
Registration Number	Marketed Product Name	Hospital/Health Care Facilities (Y/N)	Institutional (including schools, office buildings) (Y/N)	Residential (Y/N)
10324-105	Maquat 128-PD	Y	Y	Y
10324-105-66243	Germ Control	Y	Y	N
10324-117	Maquat 710-M	Y	Y	Y
10324-117-670	Quick San 10	Y	Y	N
10324-170	Maquat 64-PD-X	Y	Y	Y
10324-198	Maquat 702.5-M	Y	Y	Y
10324-214-12120	Navigator 62 Perisept	Y	Y	N
10324-214-6186	Neutra-Guard	Y	Y	N
10324-214-8155	Husky 815 HCD Disinfectant	Y	Y	N
10324-58	Maquat 128	Y	Y	Y
10324-58-670	Sunburst No-Bac	Y	Y	N
10324-59	Maquat 750-M	Y	Y	Y

www.epa.gov/oppad001/list-l-ebola-virus.html

Contaminated Durable/Non Disposable Equipment

- Quaternary ammonium compound mat—MICRO CHEM
- Replaced daily
- Use disposable pads to cleanse the contaminated equipment
- Done by patient's nurse, if equipment is in patient room

Decontamination of Unit After Patient Is Released

- Certified vendor—Safety Plus
- Use of hydrogen peroxide vapor generators
- Biological **and** chemical validators

Waste Management

Take home messages…

- **There will be a lot more waste than you anticipate**
  - **Be proactive:** Start talking to all those involved
  - **Communications:** Discuss with local authorities and your biomedical waste vendors—build your partnerships now
  - **Be very systematic**
  - **Think sustainable:** Have a plan, a back-up plan, and a back-up to the back-up plan
  - Know the rules, regulations, and guidelines
  - If you have access to **Biorisk Management** professionals, involve them in the process
  - **Document everything**

Laboratory…

Laboratory

- Dedicated laboratory for PUIs and/or known positive patients is preferred
- Must protect testing staff from blood and body fluid exposures
- Must provide clinically relevant test results

PUIs

- Risk assessment to determine risks of lab testing
- Lab testing may be performed in main laboratory during evaluation
- Collection of samples by personnel trained in appropriate PPE
- Transport
- Monitor disposition of ALL specimens

Known Positive Patients

- A dedicated lab is preferred for known Positives
- Greater control of specimen disposition
  - Fewer opportunities for spills
  - Less anxiety among staff
  - Simpler waste management

Lab Staffing

- Point-of-care staff and select main lab staff work in this lab area
- Many of the instruments fall under the point-of care section
- All staff should be trained and should maintain competency on all equipment in the lab
- Must meet regulatory requirements for scope of testing

Characteristics of Lab Staff

- Strict adherence to procedures
- Strict adherence to PPE
- Willingness to report incidents/near misses
- Adherence to occupational injury management monitoring requirements
- Willingness to be on-call separate from routine lab duties

Lab Layout Considerations

- Testing with open sample tubes performed in Class II safety cabinet
- Hematology analyzer does not require the opening of tubes, so not in safety cabinet
- Sample for PCR mixed with lysis reagent and closed pouch loaded in safety cabinet, then PCR performed outside of safety cabinet

Lab PPE

- Paper scrubs
- Coverall
- Regular gloves
- Extended-cuff gloves
- Booties
- PAPR hood
- Apron

Public Health Image Library. Available at: https://phil.cdc.gov/phil/details.asp?pid=10758

Why Full PAPR in the Lab?

- Comfort!!!!!
- Better vision
- It is what the staff trained to use
- Unknown pathogen

After Testing…

- Interior and exterior surfaces of safety cabinet, table, stool, etc. cleaned with germicidal wipes
- Floor cleaned with germicidal wipes
- Doff PPE
- Periodic decontamination of the lab ("HPV" or hydrogen peroxide vapor)

Specimen Transportation Considerations

- Within healthcare facility
  - Durable, leak-proof container
  - May use the same or similar containers as used for shipping
  - Do not use pneumatic tube system
  - Minimize the risk of breakage or spill

Specimen Transportation Considerations (cont.)

- Between facilities
  - On the roads or in other conveyances requires adherence to hazardous materials regulations of USDOT
  - Shipping containers designed to minimize risk of spill

Deceased Patient…

Deceased Patient

- Understand key points in caring for a deceased patient
- Identify resources to support protocol development
- Identify equipment needed to manage the care of the body of the deceased patient
- Understand standards for transportation of human remains
- Understand mortuary care and the disposition of human remains

Teamwork

- Partner with your local and state public health department
- Know and understand your state regulations regarding human remains
- Infection can be transmitted in postmortem care settings
- Only personnel who are trained to handle infected human remains and wearing recommended PPE may touch or move any remains
- Do not wash or clean the body
- Do not embalm the body
- It is preferred that no autopsy be performed, but if an autopsy is necessary, consult your state health department and the CDC regarding necessary precautions
- Do not remove any inserted medical devices from the body (eg, IV lines, ET or other tubing, or implanted electronic medical devices)

Preparations

- Cremation is preferred, but if cremation is not an option because of safety concerns, the body should be buried in a standard metal casket or other comparable burial method
- Take a photo of the patient for identification purposes
- Visitation of patient remains can be facilitated through a video link
- Do not allow direct access to remains
- Make counseling services available to family
- Complete all necessary documentation before removing patient remains to comply with hospital and local/state health department regulations
- Have a preexisting MOU with a crematory and funeral director for cremation services after receipt of permission from family and the local health department

Preparations (cont.)

- Persons handling the remains should wears single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown
- Minimize the transportation of remains that contain virus to the extent possible
- Coordinate all transportation, including local transport for mortuary care or burial, with relevant local and state authorities in advance
- Coordinate interstate transport with the CDC by calling the Emergency Operations Center at (770) 488-7100
- Avoid transporting non-cremated remains via aircraft
- Human remains transported for interment, cremation, or medical research at a college, hospital, or laboratory are excluded from the US Department of Transportation's Hazardous Materials Regulations (49 CFR, Parts 171-180); See §173.134(b)(14)

In Conclusion

Treat your patient with respect and dignity

Remember to care for your patient's loved ones and your staff

Culture of Safety

- Shared accountability for safety
- Effective and assertive communication is central to the safety of the team
- Direct patient care communication
- Daily team huddles

Additional Resources

- Ebola Preparedness Protocols. Emory Healthcare. www.emoryhealthcare.org/ebola-protocol/ehc-message.html
- Ebola-Associated Waste Management. Centers for Disease Control and Prevention. www.cdc.gov/vhf/ebola/healthcare-us/cleaning/waste-management.html
- Infection Prevention and Control Recommendations for Hospitalized Patients Under Investigation (PUIs) for Ebola Virus Disease (EVD) in U.S. Hospitals. Centers for Disease Control and Prevention. www.cdc.gov/vhf/ebola/healthcare-us/hospitals/infection-control.html