

# Disinfection and Waste Management in the ETU

This lecture is on disinfection and waste management in the ETU.

The learning objectives for this lecture are to:

- ▶ Identify how and when to use chlorine solution and the correct strengths for different uses
- ▶ Identify proper ways to dispose of various wastes
- ▶ Describe procedures for disinfection in the ETU
- ▶ Describe safe handling, moving, and burial of a corpse

To provide maximum safety in the ETU, it is important for all healthcare workers to understand the procedures for ETU disinfection, infection prevention and control, and sanitation described in this lecture.

ETU disinfection practices are influenced by two properties of the Ebola virus.

First, patients with Ebola shed large quantities of virus in blood and body fluids. Second, the Ebola virus has a lipid or fatty envelope so it is relatively fragile and easy to inactivate. Chlorine disinfection, heat, direct ultraviolet sunlight, and certain cleaning products all destroy the lipid envelope, thereby killing the virus.

Proper use of chlorine solutions can effectively kill the Ebola virus. Consequently, in this epidemic, chlorine is your friend.

Preparing Healthcare Workers to Work in Ebola Treatment Units (ETUs) in Africa

## Disinfection and Waste Management in the ETU

This presentation is current as of December, 2014. This presentation contains materials from Centers for Disease Control and Prevention (CDC), Médecins Sans Frontières (MSF), and World Health Organization (WHO).

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### Learning Objectives

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2

### Disinfection in the ETU Considerations

- ❑ Healthcare workers should understand sanitation procedures even if they may not perform all of them
- ❑ Patients shed large quantities of virus in blood and body fluids
- ❑ Ebola virus has a lipid envelope, making it relatively easy to inactivate
- ❑ Chlorine is your friend

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3

### Chlorine Solutions Standard Disinfectant in the ETU

- How can the proper use of chlorine solutions help protect me?
  - Chlorine can inactivate the virus on personal protective equipment (PPE) or other surfaces, reducing the risk of healthcare worker infection
- How should those concentrations be made?
  - Clean water is used to dissolve powdered or tablet chlorine or to dilute liquid bleach in specified concentrations
  - Label solutions accordingly

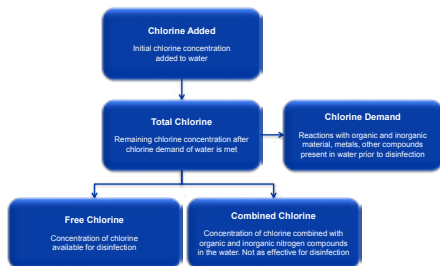
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4

Because chlorine is a critical component to stop the spread of the Ebola virus, we will spend some time talking about the effectiveness and use of chlorine solutions within the ETU. How can the proper use of chlorine solutions help protect you? Chlorine can inactivate the virus on personal protective equipment (PPE) as well as viral contamination on other surfaces.

How should those concentrations of chlorine solutions be made? Clean water, defined here as clear, colorless non-turbid water, is used to dissolve powdered or tablet chlorine formulations or to dilute liquid bleach. Once made, chlorine solutions should be labeled accordingly to indicate their concentration levels.

### Free Chlorine Provides the Disinfection Action



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5

The amount of free chlorine in the solution provides the disinfection action. This amount may differ from the amount of chlorine initially added to the water.

Clean, non-turbid water is important for free chlorine levels. Chlorine is an equal-opportunity disinfectant. In addition to reacting with Ebola virus and other pathogens, it also reacts with other compounds such as inorganic materials or metals that may be present in the water. Therefore, if the water is dirty or contains a lot of these dissolved materials, some of the chlorine will be used up in reacting with these substances. This results in what is called combined chlorine. Combined chlorine is not effective in disinfecting Ebola virus. Only the uncombined or free chlorine provides the disinfection action against the virus. Therefore, the cleaner the water, the more free chlorine will be available and this results in greater disinfecting power.

There are three basic forms of chlorine to make chlorine solutions for use in the ETU.

- ▶ Bleach, or sodium hypochlorite, is the formulation we are all familiar with. However, bleach may often be unavailable in West Africa. It is expensive to locally manufacture or import due to weight. It is usually sold as a solution between 2 and 8% and often the real concentration is lower than labeled.
- ▶ Calcium hypochlorite, also known as high-test hypochlorite or “HTH” is typically available in a powdered form and, in the United States, is commonly used to treat swimming pools. It is considered to be a relatively stable formulation of chlorine. However, experience has shown this product may be difficult to dissolve completely. This can lead to saturated concentrations of chlorine in the bottom of the vessel.
- ▶ Sodium dichloro-isocyanurate is more familiar to us as drinking water purification tablets. These come in various strengths. Sodium dichloro-isocyanurate (NaDCC) is also available in powdered form.

It is important to note all chlorine products will degrade over time, especially if not stored correctly. As a result, manufacturers’ labels may not accurately reflect the current strength of the product. Therefore, the product strength should be tested regularly.

There are two concentrations of chlorine solutions used in the ETU: 0.5% and 0.05%.

0.5% is used to disinfect most non-living items, including corpses, contaminated surfaces, infectious body fluids (such as vomit, diarrhea, and blood), and gloved hands.

0.05% is used to disinfect living tissue and other chlorine-sensitive materials. These include all living skin, including bare hands, face, and other exposed skin, staff linens (mainly scrubs), thermometers, and eating utensils used by patients and left in the high-risk zone for re-use.

### Commercially Available Chlorine Products Used to Make Chlorine Solutions in the ETU

#### □ Bleach, sodium hypochlorite (NaClO)

- Often unavailable in West Africa
- Usually sold as a diluted solution between 2–8%



#### □ Calcium hypochlorite Ca(ClO)<sub>2</sub> or “HTH”

- Typically in powder form
- Considered to be relatively stable



#### □ Purification tablets, sodium dichloro-isocyanurate (NaDCC)

- Tablets can come in varying strengths



NOTE: All chlorine products will degrade over time, and manufacturer's label may not accurately reflect strength of product—strength of products should be tested regularly.

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6

### Chlorine Solutions Concentrations of Chlorine Solutions

#### □ Concentrations of chlorine solutions in the ETU

- 0.5% - most non-living items
  - Corpses, surfaces, vomit, diarrhea, blood, gloved hands
- 0.05% - living tissue and sensitive materials
  - Bare hands, face, and other exposed skin, linens (scrubs), thermometers, plates/cups/eating utensils used by patients and remaining in high-risk zone



Photo credit: NPR.org (September 2014)

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7

### Chlorine Solutions Limitations of Disinfection in the ETU

- Proper use of chlorine solutions can kill (inactivate) Ebola virus
- Limitations
  - Chlorine solutions will be much less effective on grossly contaminated surfaces
    - Organic material must be reduced to improve disinfection effectiveness
  - Strength of chlorine solutions can degrade over time, especially in hot climates
    - Use fresh chlorine products to make dilutions, i.e. , <3 months old (bleach, HTH, tablets)
    - Properly store chlorine (no heat, light, humidity)
    - Test locally acquired products or use verified imported products
    - Prepare diluted chlorine solutions daily
    - Label all chlorine solutions with strength of solution (0.5%, 0.05%)

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8

While proper use of chlorine solutions can effectively kill the Ebola virus, there are important limitations that influence the procedures for chlorine use.

Chlorine will be much less effective on grossly contaminated surfaces, such as those soiled with vomit or diarrhea. This is a similar process to organic matter in the water reacting with chlorine solution to reduce its disinfection power. Therefore, organic material must be reduced or even removed to improve disinfection effectiveness. Using more of the chlorine solution will not help if substantial biomass is present. For chlorine to properly disinfect, it needs direct contact with the virus.

The strength of chlorine solutions can also degrade over time, especially in hot climates. To assure maximum effectiveness, use chlorine products less than three months old to make solutions. Chlorine must be stored properly (no heat, light, humidity, in an air tight plastic container) to maximize shelf life.

Test locally acquired products or use verified imported products. There are a variety of test strips or chlorometer test kits that will measure chlorine solutions. Each day, discard old diluted chlorine solutions and prepare fresh solutions. Do not expose the solutions to direct sunlight. Solutions that are exposed to sunlight or become cloudy may need to be changed or replaced more frequently. Don't forget to label all chlorine solutions with the strength of solution to prevent errors in use.

Chlorine is a common and familiar chemical and is widely used in healthcare and domestic settings. However, safety is a consideration when preparing and using chlorine solutions. The higher concentration levels used in the ETU are caustic to skin and dangerous if they come in contact with the eyes.

By way of comparison, a well-maintained swimming pool usually has a chlorine level of 1-3 parts-per-million. The 0.05% chlorine solution has 500 parts-per-million of chlorine, which is more than 100 times that of a swimming pool. The 0.5% chlorine solution is 1,000 times more concentrated than the chlorine in a swimming pool.

Allergic or toxic reactions to chlorine-containing cleaning products, while uncommon, are more often seen when using the high concentration needed for disinfection in the ETU. Allergic contact dermatitis results in skin irritation. Chlorine is a strong airway irritant, particularly in high concentrations, and can cause inhalation reactions. This can be a problem for the healthcare workers preparing the chlorine solutions when they open the chlorine powder buckets or bleach bottles, releasing plumes of dust or fumes of chlorine. However, this type of airway irritation is different from an immune-mediated allergic reaction, which is quite rare. Workers preparing chlorine solutions must use appropriate respiratory and contact protection, such as goggles, respirators, and gloves. Do not mix different cleaning products such as ammonia, and chlorine or HTH and NaDCC powders.

With an understanding of the importance of chlorine solutions in the ETU, we will now discuss specific disinfection procedures for infection prevention and control inside the ETU.

### Chlorine Solutions Toxicity Information

- Widely used in healthcare and domestic settings
- Use with caution at higher concentrations (0.5%)
  - Caustic to skin
  - Dangerous for eyes
- Allergic or toxic reactions to chlorine-containing cleaning products uncommon
  - Allergic contact dermatitis - skin irritation and damage
  - Inhalation reactions - airway irritation, sometimes strong reaction particularly in high concentrations
  - Hypersensitivity - true allergic reaction rare
  - Use appropriate respiratory and contact protection (goggles, respirators, and gloves)

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9

### Procedures for Cleaning and Disinfection

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10

### Cleaning and Disinfection Disinfect Gloved Hands

- Policies on changing outer gloves between each patient vary between ETUs
- If not changing gloves between patients, disinfect gloved hands
  - Wash gloved hands in 0.5% chlorine solution
  - Gloves exposed to 0.5% chlorine solution can be damaged over time
    - Gloves should be regularly checked for damage
    - Staff should leave the high-risk zone if gloves are damaged (including broken or sticky gloves)

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11

Clean gloves are essential to ETU infection prevention and control. However, the policies regarding changing outer gloves between each patient encounter vary between ETUs.

Those ETUs that do not require outer glove changing between patients do require disinfection of gloved hands between patients. This requires vigorous hand hygiene. The outer gloves need to be washed in 0.5% chlorine solution. However, over time, the concentration of chlorine can damage the gloves. Gloves should be regularly checked for tears or other damage or to assess whether the gloves start to feel sticky. Staff should immediately leave the high-risk zone and doff if their gloves are damaged.

### Cleaning and Disinfection ETU Surfaces

- Use 0.5% chlorine solution prepared at least daily
- Change solution and clean equipment regularly
- Start in “clean” areas and move toward “dirty” areas
- Clean and disinfect floors and horizontal work surfaces at least daily
- **DO NOT** dry sweep or wipe with a broom or dry cloth
- **DO NOT** spray disinfectant into the air (i.e., “fog”) in occupied or unoccupied clinical areas
  - Not effective
  - Possibly harmful

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12

All ETU surface areas must remain clean.

- ▶ Use 0.5% chlorine solution and other cleaning solutions that have been prepared the same day.
- ▶ Solution remaining at the end of the day should be discarded. Also, chlorine solutions are inactivated by the presence of organic material. Therefore, the chlorine solution should be discarded if it appears cloudy or has visible organic material in it. Any re-usable cleaning equipment should be changed and disinfected regularly as well.
- ▶ Remember to always start in the cleanest area and move toward the dirtiest part.
- ▶ Clean and disinfect floors and horizontal work surfaces at least daily.
- ▶ Do not dry sweep or wipe with a broom or dry cloth. This could kick up particles and spread infectious materials.
- ▶ Similarly, do not spray disinfectant into the air, either in occupied or unoccupied rooms. Ebola virus is not spread by airborne transmission so spray disinfectant is not effective and it is possibly harmful.

Body fluid spills in the ETU, such as vomit, diarrhea, blood, and urine, are considered highly infectious. ALWAYS wear high-risk PPE when cleaning body spills and begin disinfection immediately after the spill occurs.

- ▶ First, spray one or more disposable absorbent pads with 0.5% chlorine solution and place the pads over the spill. Then use the pads to remove the solid organic material. However, do not wipe the surface with these pads. Double bag the pads and organic waste for disposal.
- ▶ Repeat this step as needed until the organic material is fully removed.
- ▶ Spray or pour 0.5% chlorine solution on the spill area. Be careful to avoid splashing. Let it stand for 15 minutes.
- ▶ Use disposable absorbent pads to soak up any remaining chlorine solution; then double bag the pads for disposal.

When cleaning body spills, use materials and equipment that are either disposable or can be fully disinfected.

Disinfection practices for linens and scrubs will vary. Follow the guidelines of your ETU regarding linen disposal. In linens and clothes from patients with Ebola are incinerated. Staff scrubs are generally washed in 0.05% chlorine solution followed by soap and water.

Next, we will talk about waste management.

### Cleaning and Disinfection Spills in the ETU

- ❑ **ALWAYS** wear high-risk PPE when cleaning body spills
- ❑ **Begin disinfection of body spills (vomit, diarrhea, blood, urine) immediately**
  1. Spray a disposable absorbent pad with 0.5% chlorine solution and use it to remove solid organic material → double bag pads and organic waste for disposal
  2. Repeat as needed until organic material is fully removed
  3. Spray or pour 0.5% chlorine solution on body spill area, avoid splashing → let stand 15 minutes
  4. Use disposable absorbent pads to soak up remaining chlorine solution → double bag pads for disposal
- ❑ **Use materials and equipment that are disposable or can be fully disinfected**

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13

### Cleaning and Disinfection Washing Linens and Scrubs in the ETU

- ❑ Follow guidelines of your ETU regarding linen disposal
- ❑ In practice, linens and clothes from patients with Ebola are usually incinerated
- ❑ Staff linen (scrubs) are generally washed in 0.05% chlorine solution followed by soap and water

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14

### Waste Management

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15

### Waste Management in the ETU Containers and Bags

- Sharps containers
  - Leak-proof and puncture-resistant sharps container
    - Recommended but not always available
  - Dispose in sharps pit when full
- Leak-proof biohazard bags
  - Double bag waste (e.g., sealable plastic bag)
    - Spray each bag with 0.5% chlorine solution
  - Incinerate bags
- Trash cans for solid waste
  - Disinfect trash cans after emptying
- Buckets for liquid waste
  - Disinfect buckets after emptying into latrine



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16

Multiple types of containers are used to contain and dispose of the different types of waste generated in the ETU.

Sharps containers ideally should be leak-proof and puncture-resistant, but these are not always available. Médecins Sans Frontières (MSF) uses World Health Organization-approved cardboard safety boxes so the containers can be incinerated. However, the heavy use of chlorine spray and the wet atmosphere inside the ETU make it likely the cardboard can get wet and break, so it should be placed inside a plastic bucket. Sharps containers should be disposed of in a sharps pit. Be sure to dispose of sharps containers before they are filled to the top so they do not become safety hazards. Sharps containers should be readily available and easily identifiable in the ETU. If commercial sharps containers are not available, improvised containers can be made with puncture-resistant materials such as drums or paint cans. Follow the protocol of your ETU for guidance about sharps container disposal.

Most other waste is double-bagged in leak-proof biohazard bags. If possible, the inner bag should be a sealable bag, (such as Ziploc® brand) if available. The MSF protocol is to spray the inside and outside of each bag with 0.5% chlorine solution. Bags of infectious waste are incinerated.

There are also trash cans inside the ETU for solid waste. These trash cans should stay inside the ETU and should be disinfected after emptying. The bins should be lined with plastic bags to avoid requiring additional handling of the waste. The waste should be double bagged as just described.

Buckets are provided for liquid waste. The buckets should be disinfected with 0.5% chlorine solution after liquid waste is emptied into the latrine or a dedicated pit. The chlorine solution used to disinfect the buckets should also be dumped the same way.



Staff must wear high-risk PPE to dispose of organic waste from patients with Ebola.

Body spills and the materials used to clean the spills should be double bagged and incinerated.

Wastewater and human waste are disposed of in an isolated latrine or toilet designated for waste contaminated with Ebola virus.

Reusable containers, such as bedpans and buckets, should be disinfected with 0.5% chlorine solution.

### Waste Management in the ETU Organic Waste from Patients with Ebola

- Must wear high-risk PPE
- Disposing of material from body spills
  - Body fluid spill (vomit, excrement, mucus, blood) and materials used to clean spill should be incinerated
- Disposing of wastewater/human waste
  - Use isolated latrine or toilet designated for waste contaminated with Ebola virus
- Disinfect reusable containers (e.g., bedpan, bucket) with 0.5% chlorine solution

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17

Patient transport is not directly related to disinfection and waste management practices within the ETU. However, patient transport raises contamination and infection prevention and control issues. Proper patient transport procedures reduce contamination risks.

### Transporting a Patient into the ETU

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18

### Transporting a Patient into the ETU

- ❑ Don high-risk PPE in preparation for moving the patient
- ❑ Assess the situation before moving the patient
- ❑ Assist the patient in descending from the vehicle, taking into account patients are often extremely weak
- ❑ If the patient cannot walk, then the patient will need to be moved by stretcher
  - Four staff members should move a patient (one person at each corner of the stretcher)
  - Avoid turning your back to the stretcher

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19

When transporting a patient suspected to have Ebola to the ETU, certain steps and precautions must be taken.

- ▶ First, don high-risk PPE in preparation for moving the patient.
- ▶ Next, assess the situation before moving the patient. Is it safe for you to move the patient at this time? What additional equipment do you need? Where are you moving the patient to and is there room for the patient?
- ▶ Finally, assist the patient. For example, the patient may need help in descending from the vehicle. Patients are often extremely weak. If possible, patients should be encouraged to move to the edge of the vehicle so you can help them safely exit. This reduces exposure to less protected parts of your PPE.

If the patient cannot walk, then the patient will need to be moved by stretcher. Four staff members should move a patient by stretcher, with a person at each corner. Keep your apron to the stretcher. If you are one of the people at the front, this may mean walking to the side of the stretcher rather than in front of it. Although turning your back to the stretcher poses a risk because this is the least protected part of your PPE, this is preferable to trying to walk backwards which presents a significant fall risk.

### Assisting Patient on Arrival at ETU



Assisting patient on arrival at ETU  
Photo provided by MSF

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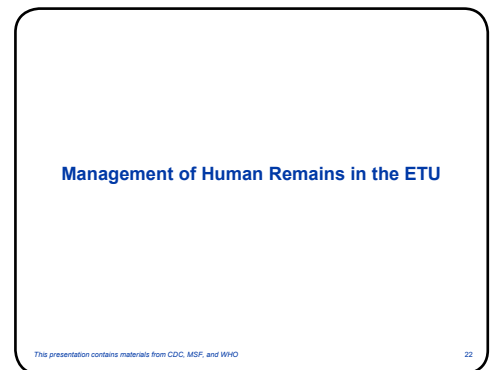
20

Here is a photo of a staff member in high-risk PPE helping a patient out of the back of a pick-up truck. Notice she is sitting on the tailgate first before stepping down to make it easier for the healthcare worker to assist her.

Here is another photo of two staff members assisting a patient out of the back of a vehicle.

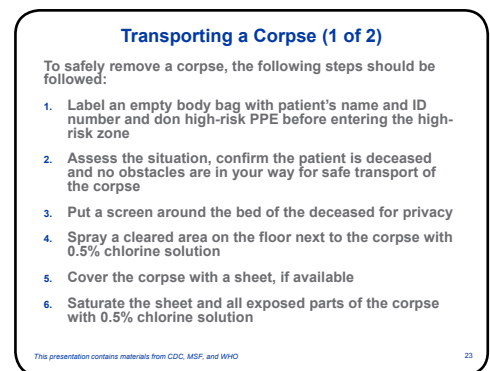


Because of the extremely high viral load in a corpse, managing human remains safely in the ETU requires special attention to disinfection and sanitation practices.



The following protocol describes steps common to many ETUs for transporting a corpse from the ETU to the morgue. Remember it is important to handle the corpse as little as possible and to wash gloved hands between every step:

1. First, label an empty body bag with the patient's name and ID number and don high-risk PPE before entering the high-risk zone.
2. Assess the situation. Confirm that the patient is deceased. Also make sure there are no obstacles in your way so you can safely transport the corpse.
3. Put a screen around the bed of the deceased patient for privacy.
4. Spray the area around the corpse with 0.5% chlorine solution.
5. Cover the corpse with a sheet, if one is available, and this has not already been done.
6. Saturate the sheet and all exposed parts of the corpse with 0.5% chlorine solution.



### Transporting a Corpse (2 of 2)

7. Place the body bag on the floor or a stretcher with the flap opening away from the bed
8. Pour/spray 0.5% chlorine solution into the inside of the empty body bag
9. Place disposable absorbent pads inside the body bag and spray them with 0.5% chlorine solution
10. Place the corpse along with all soiled materials (clothing, linens) inside the body bag
11. Spray the corpse inside the body bag
12. Zip the body bag closed with both zippers at the head
13. Spray the outside of the body bag
14. Transport the body bag to the morgue in the high-risk zone

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24

7. Place the body bag on the pre-sprayed floor or on a pre-sprayed stretcher with the flap opening away from the bed.
8. Pour or spray 0.5% chlorine solution into the inside of the empty body bag.
9. Place disposable absorbent pads inside the body bag and spray them with 0.5% chlorine solution. The absorbent pads are added to absorb body fluid released during decomposition.
10. Place the corpse along with all soiled materials, such as clothing and linens, inside the body bag away from the decedent's face as the body might be shown to the family before burial.
11. Spray the corpse inside the body bag.
12. Zip the body bag closed, both zippers closed at the head.
13. Spray the outside of the body bag with 0.5% chlorine solution taking care to spray the handles and the zipper.
14. Finally, transport the body bag to the morgue in the high-risk zone.

### Transporting a Corpse Potential Risk



Assisting patient on arrival at ETU  
Photo provided by MSF

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25

This is a photo of ETU staff transporting a corpse. Do you notice anything wrong with this picture? The lead staff member is walking with his back towards the stretcher, exposing the least-protected part of his PPE to a potentially highly contaminated body bag.

To make this a safer transport with three people, you should have two people in front, each holding the stretcher pulled to their sides, and one person in back moving forward.

Family members may want to see the deceased. Having the zipper at the head will allow staff easy access to the face to facilitate viewing of the corpse.

In summary:

- ▶ All patients, corpses, body fluids, and surfaces inside the high-risk zone are considered contaminated.
- ▶ Chlorine solutions are the best option for effective disinfection inside the ETU.
- ▶ There are two chlorine concentrations to remember:
  - 0.5% for non-living items, such as corpses, gloved hands, surfaces, vomit, feces, and blood.
  - 0.05% for living tissue such as skin, including hands. This concentration is also for scrubs and sensitive medical equipment like thermometers.
- ▶ Remember to disinfect body spills immediately. These include vomit, blood, feces, and urine.
- ▶ Transport patients into the ETU with careful attention to infection prevention and control measures.
- ▶ Deceased patients with Ebola remains must be handled carefully but respectfully.
- ▶ Finally, procedures and recommendations in your ETU should always be based on common sense and infection prevention and control principles.

### Proper Position of Remains in Body Bag



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26

### Summary

- All patients, corpses, body fluids, and surfaces inside the high-risk zone are considered contaminated
- Chlorine solutions are the best option for effective disinfection
- Chlorine concentrations to remember
  - 0.5% (non-living items—corpses, gloved hands, surfaces, vomit, feces, blood)
  - 0.05% (living tissue—hands, face, and other skin, scrubs)
- Disinfect body spills (vomit, blood, feces, or urine) immediately
- Transport patients into the ETU with careful attention to infection prevention and control measures
- The remains of patients with Ebola must be handled carefully but respectfully
- Procedures and recommendations in your ETU should be based on infection prevention and control principles and common sense

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27

<http://www.cdc.gov/vhf/ebola>

For more information please contact Centers for Disease Control and Prevention  
1600 Clifton Road NE, Atlanta, GA 30333  
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348  
E-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov) Web: [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



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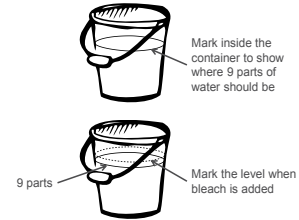
**Chlorine Solution Appendix/Supporting Documents**

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29

**Preparing 0.5% Chlorine Solutions**

- A 1:10 solution has 9 parts water and 1 part bleach



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32

**How to Make Chlorine Solutions for Environmental Disinfection**

- Using Liquid Bleach (~5% Chlorine)

$$\frac{\% \text{ chlorine in liquid bleach}}{\% \text{ chlorine desired}} - 1 = \text{Total parts of water for each part bleach}$$

Example: To make a 0.5% chlorine solution from 5.0% bleach:

$$\frac{5.0\%}{0.5\%} - 1 = 9 \text{ parts water for each part bleach}$$

- Using Powdered Chlorine (bleach powder, HTH)

$$\frac{\% \text{ chlorine desired}}{\% \text{ chlorine in powder}} \times 1000 = \text{Grams of powder for each liter of water}$$

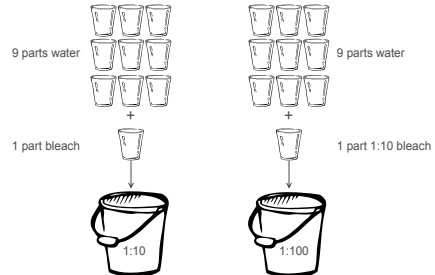
Example: To make a 0.5% chlorine solution from powder containing 35% active chlorine:

$$\frac{0.5\%}{35\%} \times 1000 = 14.3 \text{ grams of powder in each liter of water}$$

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30

**Preparing 0.05% Chlorine Solutions**



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33

**How to Make Chlorine Solutions for Environmental Disinfection**

- Using sodium dichloro-isocyanurate (NaDCC) tablets

Starting with:	0.5% chlorine solution	0.05% chlorine solution
Sodium dichloro-isocyanurate (NaDCC) at 1 gram active chlorine per tablet	5 tablets/litre	5 tablets/10 litres

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31

**Recommended Chlorine Solutions and Uses in Typical ETUs**

Chlorine Solution	Recommended Uses as Disinfectant
0.5% (5,000 ppm or 1:10)	<ul style="list-style-type: none"> <li>Surfaces or objects contaminated with blood or other body fluids (let stand on objects/surface for 15 minutes)</li> <li>Toilets and bathroom (let stand on surface for 15 minutes)</li> <li>Soiled linens (soak fully immersed in solution for 10-15 minutes)</li> <li>Mattress covers (let stand on objects/surface for 15 minutes)</li> <li>Corpses (wipe body bag and coffin with disinfectant)</li> <li>Gloved hands, aprons, and goggles when removing PPE</li> <li>Footbaths</li> <li>Layer packaging when transporting blood samples (spray each layer before packing into next)</li> </ul> <p><b>Note:</b> This is a strong, caustic solution. Avoid direct contact with skin and eyes.</p>
0.05% (500 ppm or 1:100)	<ul style="list-style-type: none"> <li>Everyday cleaning of surfaces and floors</li> <li>Hand-washing for bare hands and skin</li> <li>Medical equipment, including thermometers</li> <li>Patient bedding and clothing (soak for 30 minutes)</li> <li>Plates, cups, and eating utensils</li> <li>Contaminated waste for disposal</li> </ul>

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34