

Handling of Human Remains Containing Ebola Virus Disease

University of Nebraska
Medical Center



Nebraska
Medicine

Objectives

After reviewing this presentation, participants will be able to:

Explain the process of preparing human remains of an Ebola virus infected patient for cremation or burial.

Verbalize understanding of the infection control practices needed to safely process the remains of a deceased patient with Ebola virus disease.

Describe the mortuary care of Ebola infected human remains.

Describe how learnings obtained through this education offering will be applied at participant's place of work to prevent disease transmission during the care of deceased patients from Ebola Virus.



Nebraska Resources

Official Nebraska Government Website
NEBRASKA DEPARTMENT OF HEALTH & HUMAN SERVICES
 Helping People Live Better Lives

Facts and Resources **EBOLA** DHHS

Nebraska Specific Information

Nebraska Public Health Training Center: What's What? EBOLA Trainings and Events.

Nebraska Public Health Training Action

EBOLA DHHS nebraska

Contact us: DHHS.prepared@nebraska.gov

When it comes to disease detection and public health emergencies, our goal is to protect Nebraskans. Only the Nebraska Emergency Management Agency, local health departments, hospitals, the Veterans and other local public health agencies, and state agencies are responsible for more than 12 states, together with the resources of public health, training, laboratory, and response resources.

Preparedness planning and response teaming are critical to being able to plan for the worst, hope for the best and stand ready to respond to whatever comes our way.

Please feel free to contact us with your questions or comments at DHHS.prepared@nebraska.gov.

Nebraska's Biocontainment Unit/Nebraska Medicine/UNMC

Nebraska's Biocontainment Unit at the Nebraska Medical Center has built on the expertise of existing specialized care to provide comprehensive care for infectious disease. Only Nebraska Medicine and the University of Nebraska Medical Center has been selected to respond to more than 12 states, together with the resources of public health, training, laboratory, and response resources.

Nebraska Medicine's Biocontainment Unit, also Nebraska's Biocontainment Unit, has been selected to respond to more than 12 states, together with the resources of public health, training, laboratory, and response resources.

- Biocontainment Unit Biocontainment, and Quarantine and Isolation
- Medical and Emergency Response Coordination Support through Simulation (CERTICS) Response
- The Nebraska Public Health Laboratory

DHHS Ebola Health Alerts and Advisories
DHHS News Releases and Statements
DHHS Emergency Medical Services
Nebraska's Local Health Departments
Nebraska Public Health Laboratory

Health Department
 Promoting and Protecting Public Health

Questions and Answers on Ebola

The Douglas County Biocontainment Unit can be reached at 402.644.2010. The line is active from 8 a.m. to 4 p.m. Monday through Friday.

The CDC is also working to disseminate information to the public about Ebola. The current information is allowing our citizens in the United States, Liberia, Nigeria, and Sierra Leone to take precautions to avoid infection in the United States. A small number of people have been diagnosed with a fever, illness, and weakness in Liberia and Sierra Leone, but the virus does not appear to have been widely spread.

CDC is working to ensure U.S. government agencies, the World Health Organization, and other domestic and international partners are up to date on the latest information. CDC is also working to disseminate information to the public about Ebola. The current information is allowing our citizens in the United States, Liberia, Nigeria, and Sierra Leone to take precautions to avoid infection in the United States. A small number of people have been diagnosed with a fever, illness, and weakness in Liberia and Sierra Leone, but the virus does not appear to have been widely spread.

What is Ebola?
 Ebola is a deadly virus disease. It is a new and deadly disease caused by infection with one of the Ebola virus strains (Zaire, Sudan, Gabon, or the Forest Zaire). Ebola causes viral hemorrhagic fever (EHF). Ebola is caused by 12-16 near the body. Ebola is spread through the air by sweat, in spit, tears, or fluids. In Africa, Ebola has also been spread by contact with a patient's blood and other body fluids.

Signs and symptoms
 What are the signs and symptoms of Ebola?
 Signs and symptoms of Ebola include fever (greater than 38.3°C or 101°F) and severe weakness, muscle pain, vomiting, diarrhea, headache, or decreased hearing or vision. Signs and symptoms may appear anywhere from 2 to 21 days after exposure to Ebola, although 1 to 15 days is most common.

How Ebola spreads
 How is Ebola spread?
 The virus is spread through direct contact (through broken skin or mucous membranes) with blood and body fluids (saliva, sweat, urine, and breast milk) of a person who is sick with Ebola, or with objects that have been contaminated with the virus. Ebola is also spread through the air by sweat, in spit, tears, or fluids. In Africa, Ebola has also been spread by contact with a patient's blood and other body fluids.

Who is most at risk of getting Ebola?
 Healthcare providers caring for Ebola patients and family, and those in close contact with Ebola patients are at the highest risk of getting and spreading the virus. Close contact includes touching the blood or body fluids of sick patients.

Can Ebola be spread through the air?
 In some places affected by the current outbreak, there may be spread in homes with limited resources (for example, no running water, no electricity, or no proper ventilation). However, based on available information, we do not believe that Ebola is being spread through the air in the United States.

Can I get Ebola from a person who is weakened but doesn't have fever or any symptoms?
 No. A person infected with Ebola has no contagious, viral symptoms.

Is a person infected with Ebola contagious when they are not showing symptoms?
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Biocontainment Unit at the Nebraska Medical Center

Biocontainment Unit

The United States Centers for Disease Control commissioned the Nebraska Biocontainment Unit (NBU) in 2005. The NBU is a collaborative product involving Nebraska Medicine, University of Nebraska Medical Center and the Nebraska Department of Health and Human Services. It was designed to provide the first line of treatment for people affected by the hemorrhagic fever (Ebola) and other viral hemorrhagic fevers (EVD). It is one of only a few biocontainment units in the United States and is a part of a 13-bed laboratory dedicated to the study of infectious diseases. The unit is supported by staff for anyone exposed to a highly contagious and dangerous disease. Early detection of an individual patient is essential to making sure the unit is prepared to care for the patient. The unit is also a part of a 13-bed laboratory dedicated to the study of infectious diseases. The unit is supported by staff for anyone exposed to a highly contagious and dangerous disease. Early detection of an individual patient is essential to making sure the unit is prepared to care for the patient. The unit is also a part of a 13-bed laboratory dedicated to the study of infectious diseases.

The threat of global infectious diseases is very real. Nebraska is prepared.

Download the Nebraska Biocontainment Unit brochure

Headed by Medical Director Angela Harwell, MD, an infectious disease specialist, the Nebraska Biocontainment Unit comprises a team of an interdisciplinary group of select physicians, registered nurses, respiratory therapists and patient care technicians. Nebraska's National Level Laboratory and Biospecimen Unit, a unit in other parts of Nebraska Medicine, but remain on-call to support directly for staff when the unit is activated. Highly contagious and readily identifiable conditions the unit can handle include SARS, Lassa, amebiasis, Ebola, Zika virus and other viral hemorrhagic fevers, meningitis, and multidrug resistant tuberculosis.

Nebraska Department of Health and Human Services

<http://dhhs.ne.gov/publichealth/h/Ebola/Pages/NESpecific.aspx>

Douglas County Public Health Department

<http://www.douglascountyhealth.com/latest-news/413-questions-and-answers-on-ebola>

The Nebraska Biocontainment Unit

<http://www.nebraskamed.com/biocontainment-unit/>



Nebraska Funeral Directors Association

<http://nefda.org/2014/10/guidance-for-safe-handling-of-human-remains-of-ebola-patients-in-us-hospitals-and-mortuaries/>



Nebraska Public Health Departments

Douglas County Public Health Department	http://www.douglascounty-ne.gov/
Panhandle Health District	http://panhandlehealthdistrict.org/
North Central District Health Department	http://www.ncdhd.ne.gov/
West Central Health Department	http://www.wcdhd.org/
Southwest Nebraska Public Health Department	http://www.swhealth.ne.gov/
Loup Basin Public Health Department	http://www.loupbasinhealth.com/
Two Rivers Public Health Department	http://www.trphd.org/
Northeast Nebraska Public Health Department	http://www.nnphd.org/
Elkhorn Valley Public Health Department	http://www.elvphd.org/
East-Central District Health Department	http://ecdhd.ne.gov/
Three Rivers Public Health Department	http://threeriverspublichealth.org/
Sarpy/ Cass Department of Health & Wellness	http://www.sarpycasshealthdepartment.org
Southeast District Health Department	http://www.sedhd.org/
Four Corners Health Department	http://www.fourcorners.ne.gov
Lincoln-Lancaster County Health Department	https://lincoln.ne.gov/city/health/
Southeast District Health Department	http://www.sedhd.org/
Public Health Solutions	http://phsneb.org/



Why such a high emphasis on the safe handling of Ebola virus infected remains

Many secondary cases of Ebola virus disease in Africa was a result of handling deceased remains during burial practices.

According to the World Health Organization 80% of secondary cases in Sierra Leone were related to traditional funeral and burial practices.

Due to the risk to healthcare and mortuary providers, the Centers for Disease Control and Prevention provided guidance that was available to all health and mortuary care providers in an effort to prevent the spread of infection from mortuary practices in the United States.



Personal Protective Equipment

Anyone preparing Ebola infected remains must wear personal protective equipment (PPE) that is impervious to fluids and be trained in the process of donning and doffing PPE correctly.



NOTE:

PPE is not required when handling the cremated remains or the hermetically sealed closed casket.



Center for Disease Control and Prevention Guidelines

Due to the risk to healthcare and mortuary providers, the CDC provided guidance for the safe handling of Ebola infected human remains.

[CDC](#) > [Ebola \(Ebola Virus Disease\)](#) > [U.S. Healthcare Workers and Settings](#) > [Hospitals](#)

Guidance for Safe Handling of Human Remains of Ebola Patients in U. S. Hospitals and Mortuaries

[f](#) [t](#) [+](#) Language:

Page Summary

Who this is for: Personnel who perform postmortem care in U.S. hospitals and mortuaries.

What this is for: To protect against the postmortem spread of Ebola infection at the site of death, prior to transport, during transport, at the mortuary, and during final disposition of remains

How to use: To guide staff in the safe handling of human remains that may contain Ebola virus by properly using personal protective equipment (PPE) and following decontamination measures at every step of the process. See CDC's [Mortuary Guidance Job Aid](#) [1 page] for more information on postmortem preparation in a hospital room.

Summary of Recent Changes

Revisions were made on January 20, 2015, to reflect the following:

- The term "hermetically sealed casket" was replaced with a recommendation to use a metal casket based on common practices in the industry.
- Additional details have been added about equipment needed for workers handling remains and step-by-step guidelines for postmortem preparation and transportation of remains.
- Additional resources have been added on personal protective equipment (PPE), decontamination, infection control, transportation of remains, and burial and cremation practices.

<http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html>



Mortuary Guidance Job Aid

The CDC guidance includes Step-by-Step instructions on the postmortem preparation in a hospital room that was designed to prevent the spread of Ebola virus infection.



Mortuary Guidance Job Aid: Postmortem Preparation in a Hospital Room

Appropriate personal protective equipment (PPE) must be worn while performing these tasks.

1. Turn on thermal sealer.
2. Use digital camera or mobile phone to take a photograph of the deceased's face. Send photo via Wi-Fi, e-mail, or text message to site manager through secure means. Decontaminate or properly discard camera or mobile phone.
3. Position gurney with three pre-opened body bags next to hospital bed.
4. Pull bed sheet(s) up and around body. Do not wash or clean body. Do not remove inserted medical equipment from body.
5. Remove first bag from gurney. Gently roll body wrapped in sheets while sliding first bag under body.
6. Complete transfer of body to first bag. Zip up bag. Minimize air in bag.
7. Disinfect gloved hands using alcohol-based hand rub (ABHR). If any areas of PPE have visible contamination, disinfect with an EPA-registered disinfectant wipe.
8. Disinfect outside of first bag with an EPA-registered hospital disinfectant.
9. Transfer first bag with body to gurney, placing it on top of second bag.
10. Disinfect gloved hands using ABHR.
11. Fold second bag around first bag and heat seal approximately 2" from edges. Remove air from second bag. Heat seal bag again approximately 1" below initial seal and heat seal diagonally across corners. Use scissors to trim off any excess material along seam. Turn off or unplug thermal sealer. Decontaminate thermal sealer before it is removed from hot zone or reused.
12. Disinfect outside of second bag with EPA-registered hospital disinfectant.
13. Disinfect gloved hands using ABHR.
14. Work third bag around second bag. Zip up third bag. Zip tie the zipper shut.
15. Disinfect gloved hands using ABHR.
16. Wheel gurney to decontamination area.
17. Decontaminate surface of body bag with EPA-registered hospital disinfectant.
 - Begin by applying the hospital disinfectant to top of bag and any exposed areas of gurney's cot.
 - Roll bag to one side to decontaminate half of bottom of bag and newly exposed portion of gurney's cot.
 - Repeat with other side of bag and gurney.
 - After visible soil has been removed with EPA-registered disinfectant wipe, reapply EPA-registered hospital disinfectant and allow sufficient contact time, as specified by manufacturer.
18. Disinfect surfaces of gurney from handles to wheels with an EPA-registered hospital disinfectant.
19. Disinfect gloved hands using ABHR.
20. Push gurney so only gurney and decontaminated body bag enter cold zone. Do not enter cold zone. A new set of workers will receive the body.
21. Proceed to PPE removal area.

For more information: Guidance for Safe Handling of Human Remains in U.S. Hospitals and Mortuaries.
<http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html>

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



<http://www.cdc.gov/vhf/ebola/pdf/postmortom-preparation.pdf>



Mortuary Guidance Job Aid

1. Turn on thermal sealer.

2. Use digital camera or mobile phone to take a photograph of the deceased's face. Send photo via Wi-Fi, e-mail, or text message to site manager through secure means. Decontaminate or properly discard camera or mobile phone.



Mortuary Guidance Job Aid



3. Position gurney with three pre-opened body bags next to hospital bed.



Bag 1
6 mil thickness with factory sealed seams (heat or welded)
Must be impervious to fluids with the zipper on top.



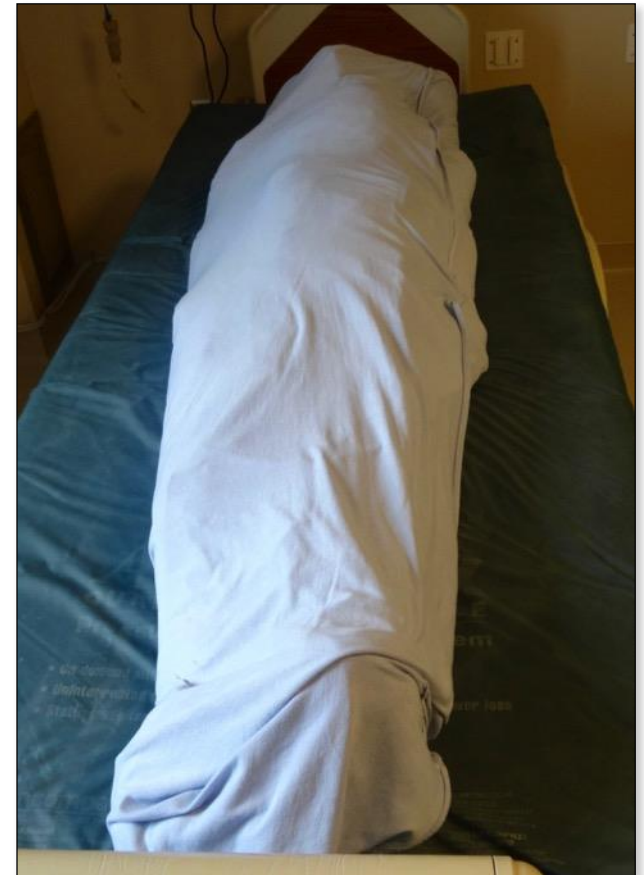
Bag 2
Chlorine-free heat sealable material that can be heat-sealed around the body to form a leak-proof body bag.



Bag 3:
Final layer. This must be laminated vinyl or other chlorine-free material, minimum of 18 mil thickness
Handles should be riveted, not sewn and reinforced with handle straps that run under the pouch.
Must be impervious to fluids.
Lockable Zipper on top.

Mortuary Guidance Job Aid

4. Pull bed sheet(s) up and around body. Do not wash or clean body. Do not remove inserted medical devices from body.



Mortuary Guidance Job Aid

5. Remove first bag from gurney. Gently roll body wrapped in sheets while sliding first bag under body.
6. Complete transfer of body to first bag. Zip up bag. Minimize air in bag.
7. Disinfect gloved hands using alcohol-based hand rub (ABHR). If any areas of PPE have visible contamination, disinfect with an EPA-registered disinfectant wipe and consider a change in outer gloves.



Mortuary Guidance Job Aid

8. Disinfect outside of first bag with an EPA-registered hospital disinfectant.
9. Transfer first bag with body to gurney, placing it on top of second bag.
10. Disinfect gloved hands using ABHR.

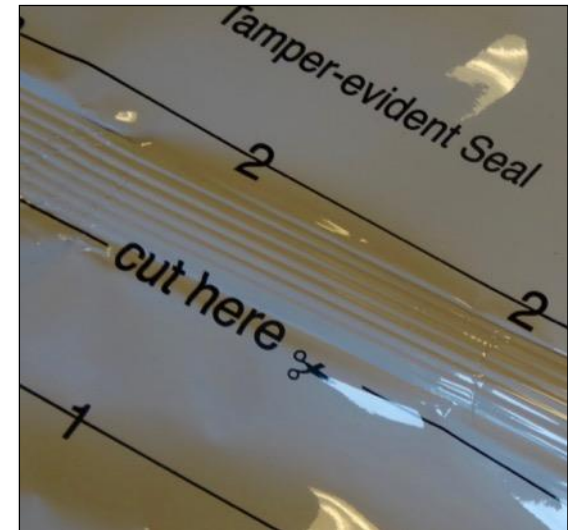


Mortuary Guidance Job Aid

11. Fold second bag around first bag and heat seal approximately 2" from edges. * **Remove air from second bag.**



Ridges from thermal sealer



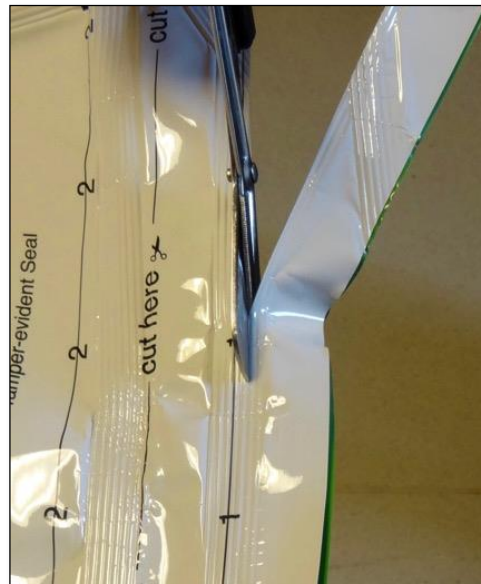
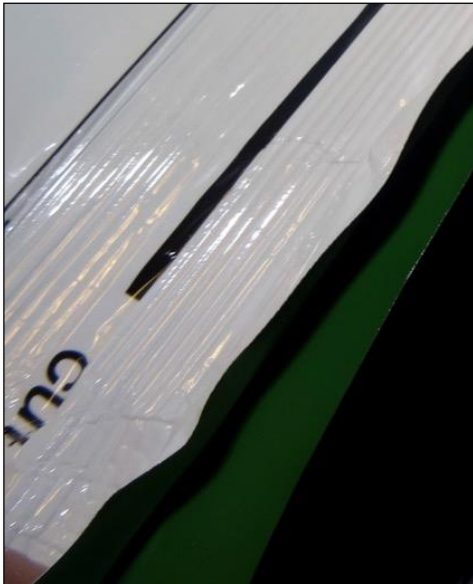
Note: the latest version of Bioseal has printed information that directs the primary function of the material.

It does not direct the sealing process for containing Ebola virus remains.



Mortuary Guidance Job Aid

11. Use scissors to trim off any excess material along seam. Turn off and unplug thermal sealer. Decontaminate thermal sealer before it is removed from hot zone or reused.



Mortuary Guidance Job Aid

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Mortuary Guidance Job Aid

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- Roll bag to one side to decontaminate half of bottom of bag and newly exposed portion of gurney's cot.
- Repeat with other side of bag and gurney.
- After visible soil has been removed with EPA-registered disinfectant wipe, reapply EPA-registered hospital disinfectant and allow sufficient contact time, as specified by manufacturer.



Mortuary Guidance Job Aid

18. Disinfect surfaces of gurney from handles to wheels with an EPA-registered hospital disinfectant.
19. Disinfect gloved hands using ABHR.
20. Push gurney so only gurney and decontaminated body bag enter cold zone. Do not enter cold zone. A new set of workers will receive the body.
21. Proceed to PPE removal area.

Guidance for Safe Handling of Human Remains in U.S. Hospitals and Mortuaries.
<http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html>



Transportation of Human Remains

Minimize transportation of remains that contain Ebola virus to the extent possible. Coordinate all transportation, including local transport for mortuary care or burial, with relevant local and state authorities in advance.

Avoid transporting non-cremated remains via aircraft.

Human remains transported for interment, cremation, or medical research at a college, hospital, or laboratory are **excepted** from the U.S. Department of Transportation's Hazardous Materials Regulations (49 C.F.R., Parts 171-180). See §173.134(b)(14).

<http://www.cdc.gov/vhf/ebola/healthcare-us/hospitals/handling-human-remains.html>



Key Points for Healthcare Providers

- Ebola virus can be transmitted in postmortem care settings.
- Only personnel who are trained in the handling of infected human remains and wearing recommended PPE may touch or move any remains that contain Ebola virus.
- Do not remove any wound dressings or other treatment items.
- Do not remove any inserted medical devices.
- Complete all necessary documentation prior to removal of patient remains to comply with hospital, State and local health department regulations.
- Have a pre-existing MOU with a crematory and funeral director for cremation services after receipt of permission from family and the local health department.
- 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.



Key Points for Morticians

- Do not perform embalming. The risks of occupational exposure to Ebola virus while embalming outweighs its advantages; therefore, bodies infected with Ebola virus should **not** be embalmed.
- Do not open the body bags.
- Do not remove remains from the body bags. Bagged bodies should be placed directly into a hermetically sealed casket.
- Mortuary care personnel should wear PPE listed above (surgical scrub suit, surgical cap, impervious gown with full sleeve coverage, eye protection (e.g., face shield, goggles), facemask, shoe covers, and double surgical gloves) when handling the bagged remains.
- In the event of leakage of fluids from the body bag, thoroughly clean and decontaminate areas of the environment with EPA-registered disinfectants which can kill a broad range of viruses in accordance with label instructions. Reusable equipment should be cleaned and disinfected according to standard procedures.

<http://nefda.org/2014/10/guidance-for-safe-handling-of-human-remains-of-ebola-patients-in-us-hospitals-and-mortuaries/>



To View a Video of the Nebraska Biocontainment Unit Process



Watch this video by clicking this link: <https://youtu.be/5NdiUfCNpIA>



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