

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

These recommendations give guidance on the safe handling of human remains that may contain Ebola virus and are for use by personnel who perform postmortem care in U.S. hospitals and mortuaries. In patients who die of Ebola virus infection, virus can be detected throughout the body.

Ebola virus can be transmitted in postmortem care settings by laceration and puncture with contaminated instruments used during postmortem care, through direct handling of human remains without appropriate personal protective equipment, and through splashes of blood or other body fluids (e.g. urine, saliva, feces) to unprotected mucosa (e.g., eyes, nose, or mouth) which occur during postmortem care.

- Only personnel trained in handling infected human remains, and wearing PPE, should touch, or move, any Ebola-infected remains.
- Handling of human remains should be kept to a minimum.
- Autopsies on patients who die of Ebola should be **avoided**. If an autopsy is necessary, the state health department and CDC should be consulted regarding additional precautions.

## Definitions for Terms Used in this Guidance

*Cremation*: The act of reducing human remains to ash by intense heat.

*Hermetically sealed casket*: A casket that is airtight and secured against the escape of microorganisms. A casket will be considered hermetically sealed if accompanied by valid documentation that it has been hermetically sealed AND, on visual inspection, the seal appears not to have been broken.

*Leakproof bag*: A body bag that is puncture-resistant and sealed in a manner so as to contain all contents and prevent leakage of fluids during handling, transport, or shipping.

## Personal protective equipment for postmortem care personnel

- **Personal protective equipment (PPE)**: Prior to contact with body, postmortem care personnel must wear PPE consisting of: 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. Additional PPE (leg coverings, apron) might be required in certain situations (e.g., copious amounts of blood, vomit, feces, or other body fluids that can contaminate the environment).
- **Putting on, wearing, removing, and disposing of protective equipment**: PPE should be in place **BEFORE** contact with the body, worn during the process of collection and placement in body bags, and should be removed immediately after and discarded as regulated medical waste. Use caution when removing PPE as to avoid contaminating the wearer. Hand hygiene (washing your hands thoroughly with soap and water or an

alcohol based hand rub) should be performed immediately following the removal of PPE. If hands are visibly soiled, use soap and water.

## Postmortem preparation

- **Preparation of the body:** At the site of death, the body should be wrapped in a plastic shroud. Wrapping of the body should be done in a way that prevents contamination of the outside of the shroud. Change your gown or gloves if they become heavily contaminated with blood or body fluids. Leave any intravenous lines or endotracheal tubes that may be present in place. Avoid washing or cleaning the body. After wrapping, the body should be immediately placed in a leak-proof plastic bag not less than 150 µm thick and zippered closed. The bagged body should then be placed in another leak-proof plastic bag not less than 150 µm thick and zippered closed before being transported to the morgue.
- **Surface decontamination:** Prior to transport to the morgue, perform surface decontamination of the corpse-containing body bags by removing visible soil on outer bag surfaces with EPA-registered disinfectants which can kill a wide range of viruses. Follow the product's label instructions. Once the visible soil has been removed, reapply the disinfectant to the entire bag surface and allow to air dry. Following the removal of the body, the patient room should be cleaned and disinfected. Reusable equipment should be cleaned and disinfected according to standard procedures. For more information on environmental infection control, please refer to "[Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus](http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html)(<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>)” (<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>(<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>)).
- **Individuals driving or riding in a vehicle carrying human remains:** PPE is not required for individuals driving or riding in a vehicle carrying human remains, provided that drivers or riders will not be handling the remains of a suspected or confirmed case of Ebola, and the remains are safely contained and the body bag is disinfected as described above.

## Mortuary Care

- 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. For more information on environmental infection control, please refer to “[Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus](http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html)(<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>)” (<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>(<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>)).

## **Disposition of Remains**

- Remains should be cremated or buried promptly in a hermetically sealed casket.
- Once the bagged body is placed in the sealed casket, no additional cleaning is needed unless leakage has occurred.
- No PPE is needed when handling the cremated remains or the hermetically sealed closed casket.

## **Transportation of human remains**

- Transportation of remains that contain Ebola virus should be minimized to the extent possible.
- All transportation, including local transport, for example, for mortuary care or burial, should be coordinated with relevant local and state authorities in advance.
- Interstate transport should be coordinated with CDC by calling the Emergency Operations Center at 770-488-7100. The mode of transportation (i.e., airline or ground transport), must be considered carefully, taking into account distance and the most expeditious route. If shipping by air is needed, the remains must be labeled as dangerous goods in accordance with Department of Transportation regulations (49 Code of Federal Regulations 173.196).
- Transportation of remains that contain Ebola virus outside the United States would need to comply with the regulations of the country of destination, and should be coordinated in advance with relevant authorities.

## **References**

CDC. Medical Examiners, Coroners, and Biologic Terrorism A Guidebook for Surveillance and Case Management. *MMWR* 2004;53(RR08);1-27.

(<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5308a1.htm>(<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5308a1.htm>))