

How to safely conduct burial of patient who has died from suspected or confirmed Marburg or Ebola virus disease: field situation.

Introduction and Background

After : Organization of a burial of a patient who died from Marburg virus at his home in Ngana Kamana, Uige, Angola, 2005 (film of 35 min).

http://www.canal-u.tv/video/smm/marburg_en_angola_a_uige_en_avril_2005_mise_en_biere_d_une_petite_fille.13720

WHO has developed a protocol to provide information on the safe management of dead bodies and burial of patients who died from suspected or confirmed Ebola or Marburg disease. These measures should be applied not only by medical personnel but by anyone involved in the management of dead bodies and burial of suspected or confirmed Ebola patients.

Twelve steps have been identified describing the different phases Dead Body Management (DBM) teams have to follow to ensure safe burials, starting from the moment the teams arrive in the village up to their return to the hospital after burial and disinfection and incineration procedures. These steps are based on tested experiences from the field. The handling of human remains should be kept to a minimum. Always take into account cultural and religious concerns. Only trained personnel should handle remains during the outbreak.

Step 1: Prior to departure: Team composition and preparation of disinfectants

Step 2: Assemble all necessary equipment

Step 3: Arrival at deceased patient home: prepare burial with family and evaluate risks

Step 4: Put on all Personal Protective Equipment (PPE)

Step 5: Placement of the body in the body bag

Step 6: Placement of the body bag in a coffin where culturally appropriate

Step 7: Sanitize family's environment

Step 8: Remove PPE, manage waste and perform hand hygiene

Step 9: Transport the coffin or the body bag to the cemetery

Step 10: Burial at the cemetery : place coffin or body bag into the grave.

Step 11: Burial at the cemetery : engaging community for prayers as this dissipates tensions and provides a peaceful time.

Step 12: Return to the hospital

This procedure is very sensitive for the family and the community. It can be the source of troubles or even open conflict. Before starting any procedure, the family must be prepared, with the burial process and all steps explained, especially in regards to dignity and respect of the deceased person. Once agreed and understood the burial can be performed. No burial process should take place until agreement is obtained.

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Step 1: Prior to departure: Team composition and preparation of disinfectants



Full PPE in field situation



Sprayer & supervisor



Communicator

Prior to departure

One team should comprise:

- **4 members, in charge of dead body management, wearing full PPE outreach**
- **One sprayer, wearing full PPE outreach**
- **One technical supervisor, not wearing PPE**
- **One person who interact with family and community, not wearing PPE**

All burial management team members should be clear on their roles and responsibilities, including who is the technical supervisor.

Disinfectant solutions must be prepared for the same day:

- 0.05% chlorine solution for hand hygiene
- 0.5% chlorine solution for disinfection of object and surfaces

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Step 2: Assemble all necessary equipment

❑ Assemble Body Bag to hold the body of the deceased :

- Impermeable, vinyl, minimum thickness 400 microns;
- Should be able to hold 100-125 kilos (200-250 lbs),
- At least 4 hands included in the body bag to allow safe hand carry
- Provide full containment of blood borne pathogens

❑ Assemble all necessary equipment to prevent infections :

For hand hygiene:

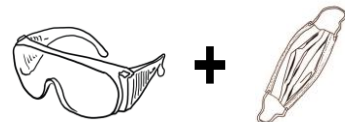
use the chlorine solution 0.05%

OR an alcohol-based handrub solution (recommended)

OR clean water, soap and towels (recommended); bring a container of water.

Personal Protection Equipment (PPE):

- One pair of disposable gloves (non-sterile, ambidextrous)
- One pair of heavy duty gloves
- Disposable coverall suit (e.g. Tyvec suit) + impermeable plastic apron
- Face protection: Goggles and mask



- Footwear: wear rubber boots or closed, puncture and fluid resistant shoes and overshoes

For waste management materials:

- Disinfectant :
 - ✓ one Hand sprayer (0.05% chlorine solution)
 - ✓ one Back Sprayer (0.5% chlorine solution)
- Leak-proof and puncture resistant sharps container
- Two leak-proof infectious waste bags: one for disposable material (destruction) and one for reusable materials (disinfection)



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Step 3: Arrival : prepare burial with family and evaluate risks



1. Arrival of the burial management team from the Red Cross Society, Ministry of Health, WHO or MSF.
2. The staff should not be wearing PPE upon arrival
3. Greet the family and offer your condolences before offloading the necessary material from the cars. Request respectfully for a family representative.
4. Discuss with the family the organization of the burial and explain the safety procedures to be followed. Ensure that the family has understood the procedure and obtain the formal agreement of the family's representative before proceeding.
5. Identify the family members who will be participating in the burial rituals (prayers, orations, closing of the coffin, ...)
6. If the family has prepared a coffin, identify 4 family members to carry the coffin.
7. Verify that the grave is dug. If this is not the case, send a team to dig the grave at the cemetery or at the area identified by the family and agreed upon by the local authorities and neighbours.
8. Propose to one or two family members to witness the preparation activities of the body of the deceased patient on behalf of the other family members.
9. Ensure that the family has prepared a civil or religious sign (e.g. identity plaque, cross,..) for identification of the grave of the deceased patient.

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Step 4: Put on all personal protective equipment (PPE)



Evaluate the set-up of the environment

- a) Locate the room where the body of the deceased patient is, open the windows and doors for optimal light and ventilation
- b) Evaluate the size and weight of the deceased in order to choose the right size of body bag. This bag needs to be opaque.
- c) If a coffin is to be used, place the coffin outside the house
- d) Identify with the family, the rooms and annexes (bathroom, toilet) that were used by the deceased patient as they need to be cleaned and disinfected

Put on all personal protective equipment (PPE) by burial management team in the presence of the family according to the recommended steps

1. Each individual wear rubber boots
2. Put on coverall suit
3. Make thumb hole in suit
4. Put on apron
5. Put on Mask
6. Put on goggles
7. Hood up
8. Put on inner gloves (under cuff)
9. Put on outer gloves (over cuff)
10. If it's going to rain, seal the outer gloves with duck tape

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Step 5: Placement of the body in the body bag



Entry into the house with at least 2 persons of the burial team :

- a. Laboratory-Epidemiology team collect a post-mortem sample for confirmation (see oral swab protocol)
- b. Place the body bag along the body
- c. Open the body bag
- d. At least two persons take the body by arms and legs
- e. Place the body in the body bag
- f. Close the body bag
- g. Disinfecting the outer side of the body bag by spraying over the surface of the body bag with a suitable disinfectant (e.g., 0.5% chlorine solution)

IMPORTANT NOTES:

- **Manipulation of the body should be minimal**
- **Remains should not be sprayed, washed or embalmed.**

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Step 6: Placement of the body bag in the coffin where culturally appropriate



1. Transport the body bag to the coffin, which should be placed outside the house, by 2 or 4 persons wearing PPE (depending on the weight of the body and the number of persons in PPE)
2. Place clothes and/or objects of the deceased patient inside the coffin if the family so wishes
3. Allow one of the family members to close the coffin, ensure they are wearing gloves at all times
4. Disinfect the coffin
5. Respect the grieving time requested by the family

At the end of this step the coffin is decontaminated and is ready to be transported

In case no coffin is available, the body bag should be gently placed on the rear of the pickup vehicle by placing the head towards the front. This should be performed by 2 staff wearing PPE.

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Step 7: Sanitize family's environment



Collection of soiled objects, disinfection if needed, or burning and cleaning and disinfection of the environment (rooms, house) wearing PPE:

1. Collect any sharps that might have been used on the patient and dispose them in a leak-proof and puncture resistant container.
2. Clean with clean water and detergent and then disinfect with a suitable disinfectant (e.g., 0.5% chlorine solution) all rooms and annexes of the house that were possibly infected by the deceased patient. Special focus should be given to areas soiled by blood, nasal secretions, sputum, urine, stool and vomit.
3. Clean with water and detergent all objects (e.g. dishes...) possibly infected by the deceased patient; then disinfect with a chlorine solution 0.5%.
4. Gather in a plastic bag, bed linen, clothes and objects of the deceased, if any, that were not placed in the coffin and need to be buried with the coffin. Ensure the bag is tightly closed and disinfected.
5. Mattresses, straw mats soiled with body fluid of the deceased patient should be burnt at a distance from the house. Ensure the family have given permission to destroy the mattresses, straw mat, etc. **Team must replace with new items.**

After this operation and before proceeding to removing the PPE think through : Did the burial team has disinfected or placed in a disinfected bag all belongings of the deceased patient ? Did the burial team burn the mattresses?

At the end of this step all places in the home are disinfected

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Step 8: Remove PPE, manage waste and perform hand hygiene

Step a: Remove apron



1. Untie the apron, remove it and discard into infectious waste bag for disinfection
2. Wash outer gloves

Step b: Remove outer gloves.

1. Remove outer gloves
2. Wash inner gloves

Step c: Remove coverall

1. Take Hood off
2. Pull zip down
3. Wash inner gloves
4. Remove coverall suit, from inside, peeling it off
5. Dispose the coverall suit in the infectious waste bag for destruction
6. Wash inner gloves



Step d: Remove goggles from behind
Place it in a waste bag for disinfection.
Wash inner gloves



Step e: Remove mask from behind
Place it in waste bag for destruction
Wash inner gloves

Step f: Remove inner gloves

1. Grasp the outer edge of the 1st glove and peel it off.
2. Hold the 1st glove in the gloved hand and drag a bare finger under the 2nd glove.



3. Remove 2nd glove from the inside, creating a "bag" for both gloves and throw it in waste bag for disposal.



4. Wash Hands

1. Disinfect rubber boots without removing them. When you are back to Hospital or Team headquarters at the end of the working day, each team member should take off rubber boots and disinfect them (see step 12).
2. Remove PPE of the burial team carefully following the recommended steps and perform hand hygiene
3. Recover the single-use PPE in an appropriate waste bag, prepared by the supervisor. The bag will be closed and disinfected and there after brought for burning to the hospital (or other designated place where single-use equipment will be burned)
4. Recover any reusable disinfected equipment in a waste bag, closed and disinfected on-site, before bringing this to the hospital or team headquarters for appropriate handling.
5. Perform hand hygiene.

At the end of this step the burial management team has removed their PPE (except the rubber boots) and has performed hand hygiene

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Step 9: Wear gloves and transport the coffin or the body bag to the cemetery



Wear gloves and transport the coffin or the body bag from the house to the cemetery

1. For the transport of the coffin, which has not been soiled, protection with household gloves is sufficient
2. Distribute household gloves to the family members who will carry the coffin
3. The rear of the car can serve as a hearse
4. The coffin is placed (delicately) on the platform of the car that will serve as the hearse, usually the head towards the front
5. Respect the time of grieving, possibly with a speech about the deceased and religious songs (chants) to aid the departure of the deceased to the cemetery, according to cultural and religious habits
6. During the departure of the funeral procession to the cemetery, some family members might be on rear of the car with the coffin
7. No family member should sit in the car cabin
8. Only the burial management team, without PPE, has the right to sit in the car cabin
9. The other participants of the funeral will follow on foot, behind the car at walking pace, with the alarm lights on and possibly dressed with funeral signs (bundles of palm trees on the bumper)
10. Conventional expression of pain through shouting, crying/songs of crying should be respected

At the end of this step the coffin has departed for the cemetery

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Step 10: Burial at cemetery: place coffin or body bag into the grave



Placement of coffin or body bag into the grave.

1. Manually carry the coffin or body bag to the grave, which is already prepared, by the carriers wearing household gloves, followed by the funeral participants
2. Place strings/ropes (and/or lianas) for lowering the coffin or body bag into the grave
3. The coffin or body bag is placed on the ropes
4. Slowly lower the coffin or body bag into the grave, either with ropes prepared in advance, or with individuals wearing gloves who stepped into the graves
5. Place the coffin or body bag and bags with clothes and objects belonging to the deceased into the grave
6. Depending on the custom in place, respect the rituals that allow for the spirit of the deceased to be liberated (opening of a node of the closed coffin, pulling the ropes from the grave,).

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Step 11: Burial at the cemetery: engaging community for prayers



Engaging community for prayers as this dissipates tensions and provides a peaceful time.

1. Respect the time required for prayers and funeral speeches
2. Family members and their assistants should be allowed to close the grave
3. Special attention should be given to the first shovel of earth, in general this is done carefully around the head area
4. Place an identification on the grave (name of the deceased and the date) and a religious symbol if requested
5. Recover all household gloves,
6. Place household gloves in an infectious waste bag for disinfection.
7. Thank the family members.
8. **Use chlorine solution 0.05% or make an alcohol-based handrub solution available for hand hygiene performance for all members involved in the funeral process, after they have removed the gloves**

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Step 12: Return to the Hospital or Team headquarters



1. Organize the incineration of the single-use (disposable) equipment at the hospital or in another designated place for burning this type of equipment
2. The reusable equipment is again disinfected and dried
3. The post-mortem samples are send to the laboratory team
4. The car used for the funerals needs to be cleaned and disinfected (especially the rear
5. At the end of the working day, before going back home, each team member should take off rubber boots and disinfect them with 0.5% chlorine solution. Rubber boots should be kept at the hospital of team headquarter.

It may be worthwhile to use a checklist, to ensure that all steps are followed during the entire process from arrival at the house until the end of the funeral. Any problems detected should be reported



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