

State of Kuwait
Ministry of Health
Infection Control Directorate



Updated Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Virus Disease (EVD)

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I. Background

Scientists assume that people are initially infected with Ebola virus through contact with an infected animal, such as a fruit bat or nonhuman primate. After that, the virus spreads from person to person, potentially affecting a large number of people.

The virus spreads through direct contact such as through broken skin or mucous membranes. The Ebola virus CANNOT spread to others when a person shows no signs or symptoms of Ebola Virus Disease (EVD). Additionally, Ebola virus is not usually transmitted by food. Healthcare workers (HCWs) and the family in close contact with Ebola patients are at the highest risk of getting the disease. During outbreaks of Ebola, the disease can spread quickly within healthcare settings.

This guidance contains the following key principles:

- In healthcare settings, The virus spreads through direct contact (such as through broken skin or mucous membranes in the eyes, nose, or mouth) with:
 - Blood or body fluids (urine, saliva, sweat, feces, vomit, breast milk, and semen) of a person who is sick with or has died from EVD.
 - Objects (such as needles and syringes) contaminated with body fluids from a person sick with EVD or the body of a person who died from EVD
- Follow **standard, contact, and droplet precautions with appropriate respiratory protection** when caring for a patient under investigation (PUI) or patient with confirmed EVD.
- Prior to working with EVD patients, all HCWs involved in the care of Ebola patients must have received repeated training and have demonstrated competency in performing all Ebola- related infection control practices and procedures, and specifically in donning/doffing proper personal protective equipment (PPE).
- PPE that covers the clothing and skin and completely protects mucous membranes is required when caring for patients with Ebola
- The overall safe care of Ebola patients in a facility must be overseen by site managers

at all times, and each step of PPE donning/doffing procedure must be supervised by a trained observer to ensure proper completion of established PPE protocols.

- Individuals unable or unwilling to adhere to infection control and PPE use procedures should not provide care for patients with Ebola.

II. Recommended Administrative and Environmental Controls for Healthcare Facilities

Protecting HCWs and preventing spread of Ebola require that proper administrative procedures and safe work practices be carried out in appropriate physical settings. These controls include the following:

- Establish and implement triage protocols to effectively and promptly identify patients who could have Ebola.
- Designate site managers who are responsible for overseeing the implementation of routine and additional precautions for healthcare worker and patient safety.
 - These site managers should have experience in implementing protocols for employee safety, infection control, and patient safety.
 - A site manager's sole responsibility is to ensure the safe delivery of clinical care to patients with Ebola.
 - They are responsible for all aspects of Ebola, including access to supplies and ongoing evaluation of safe practices with direct observation of care before, during, and after staff enter an isolation and treatment area.
 - At least one site manager should be on-site at all times in the location where a patient with Ebola is receiving care.
 - Consider engaging the hospital safety and risk management committee to further facilitate implementing Ebola-specific precautions.
- Identify, ahead of time, critical patient care functions and essential HCWs to care for patients with Ebola, collect laboratory specimens, and manage the environment and waste.
- Ensure HCWs have been trained and evaluated in all recommended protocols to safely care for patients with Ebola before they enter the patient care area.
- Ensure that workplace safety programs are in place and have been followed, in particular for blood borne pathogens, PPE and Respiratory Protection standards.

- Train HCWs on all PPE recommended in the facility's protocols. HCWs should practice donning and doffing procedures and must demonstrate competency through testing and assessment before caring for patients with Ebola.
- HCWs should practice simulated patient care activities while wearing the PPE to understand the types of physical stress that might be involved and determine tolerable shift lengths.
- Use trained observers to make certain that PPE is being used correctly and that donning and doffing PPE protocols are being adhered to by using a checklist for each step of the donning and doffing procedure.
- Designate spaces so that PPE can be donned and doffed in separate areas to prevent any cross- contamination.

Key safe work practices include the following:

- Identify and promptly isolate the patient with Ebola in a single patient room with a closed door and a private bathroom.
- Limit room entry to only those HCWs essential to the patient's care and restrict non-essential personnel and visitors from the patient care area.
- Monitor the patient care area at all times, and, at a minimum, log entry and exit of all HCWs who enter the room of a patient with Ebola.
- Be able to safely conduct routine patient care activities (e.g., obtaining vital signs and conducting clinically- appropriate examinations, collecting and appropriately packaging laboratory specimens).
- Dedicate a trained observer to watch closely and provide coaching for each donning and each doffing procedure to ensure adherence to donning and doffing protocols.
- Ensure that HCWs take sufficient time to don and doff PPE slowly and correctly without distraction.
- Reinforce the need to keep hands away from the face during any patient care and to limit touching surfaces and body fluids.
- Frequently disinfect gloved hands by using an alcohol-based hand rub (ABHR), particularly after contact with body fluids.

- Prevent needlestick and sharps injuries by adhering to correct sharps handling practices, avoid unnecessary procedures involving sharps, use needleless IV systems whenever possible.
- Immediately clean and disinfect any visibly contaminated PPE surfaces, equipment, or patient care area surfaces using a Ministry of Health (MOH) approved disinfectant wipe.
- Regularly clean and disinfect surfaces in the patient care area, even in the absence of visible contamination.
- Only nurses should clean and disinfect surfaces in the patient care areas to limit the number of additional HCWs who enter the room.
- Observe (by the site manager or his/her designee) HCWs in the patient room if possible (e.g., through a glass-walled intensive care unit [ICU] room) to identify any unrecognized lapses or near misses in safe care.
- Establish a facility exposure management plan that addresses decontamination and follow-up of HCWs in the case of any unprotected exposure. Training and follow-up should be part of the healthcare worker training.

III. Procedures for Dealing with Suspected or Confirmed Cases of EVD

1. Notification

Treating physicians and preventive medicine physicians should notify infection control department for all patients suspected or confirmed of EVD to apply the optimal precautions in the proper time.

2. Triage Area

- Assign dedicated area/ space especially for Ebola suspected cases with separate entrance and exit from the hospital for rapid identification of patients and prompt application of appropriate precautions, and implementation of source control.
- Instructions for patients at the entrance to alert people with symptoms to go directly to this area/ space.

- This area/ space shall be well equipped with hand washing station, paper towel, alcohol hand rub, infectious waste bags and yellow sharp box and private bathroom for patient use.
- Organize the area/ space to permit spatial separation (at least 1 meter) between patients.
- Ensure that triage area is adequately ventilated.
- Infection control measures in triage area:
 - Standard precautions should always be applied in all healthcare settings for all patients.
 - Infection control measures described in this policy should be applied for any patient known or suspected to have EVD.

Triage recommendations

- Immediately upon a person's entrance to the emergency department (ED), or in advance of entry if possible, a relevant exposure history should be taken including exposure criteria of whether the patient has traveled internationally or had contact with an individual with EVD within the previous 21 days. Because the signs and symptoms of EVD may be nonspecific and are present in other infectious and noninfectious conditions relevant exposure history should be first elicited to determine whether EVD should be considered further. If the patient is unable to provide history due to clinical condition or other communication barrier, history should be elicited from the next most reliable source (family, friend, Emergency Medical Services (EMS) provider).
- Patients who meet the exposure criteria should be further questioned regarding the presence of signs or symptoms compatible with EVD. These include: fever ($\geq 38.0^{\circ}\text{C}$) or headache, fatigue, weakness, muscle pain, vomiting, diarrhea, abdominal pain, or hemorrhage (bleeding gums, blood in urine, nose bleeds, coffee ground emesis or melena).
- All patients should be routinely managed using precautions to prevent any contact with blood or body fluids.

If an exposure history is unavailable, clinical judgment should be used to determine whether to empirically implement the following protocol. If a relevant exposure history is reported and signs or symptoms consistent with EVD are present, the following measures should be implemented IMMEDIATELY:

- Isolate the patient in a private room or separate enclosed area with private bathroom and adhere to procedures and precautions designed to prevent transmission by direct or indirect contact (dedicated equipment, hand hygiene, and restricted patient movement). If the patient is arriving by Emergency Medical Services (EMS) transport, the emergency department should be prepared to receive the patient in a designated area (away from other patients) and have a process in place for safely transporting the patient on the stretcher to the isolation area with minimal contact with non-essential HCWs or the public.
- To minimize transmission risk, only essential HCWs with designated roles should provide patient care. A log should be maintained of all personnel who enter the patient's room.
- All HCWs who have contact with the patient should put on appropriate PPE based on the patient's clinical status. If the patient is exhibiting obvious bleeding, vomiting, copious diarrhea or a clinical condition that warrants invasive or aerosol-generating procedures (intubation, suctioning, active resuscitation), PPE designated for the care of hospitalized patients as outlined in this guidance should be used.
- If the patient requires active resuscitation, this should be done in a pre-designated area using equipment dedicated to the patient.
- If these signs and symptoms are not present and the patient is clinically stable, HCW should at a minimum wear: 1) face shield, 2) surgical face mask, 3) Single-use, fluid-resistant gown and 4) two pairs of examination gloves where the outer gloves have extended cuffs.
- All equipment used in the care of these patients should not be used for the care of other patients until appropriate evaluation and decontamination.
- Notify Hospital Administration, the Preventive Medicine Department and Infection Control Office immediately of patients with EVD exposure history regardless of symptoms.
- Once appropriate PPE has been put on, continue obtaining additional history and performing physical examination and routine diagnostics and interventions which may include placement of peripheral IV and phlebotomy.
- The decision to test a patient for EVD should be made in consultation with the relevant preventive medicine department. Patient evaluation should be conducted with dedicated equipment as required for patients on transmission-based precautions.

3. Hand Hygiene

- HCW should perform hand hygiene of bare hands before donning PPE and after removal of PPE.
- Frequent gloved hand disinfection is required during patient care or contact with potentially infectious materials, immediately before leaving patient room and during doffing of PPE.
- Healthcare facilities should ensure that supplies for performing hand hygiene are available.

4. Personal Protective Equipment (PPE)

4.1 Principles of PPE

HCWs must follow the basic principles below to ensure that no infectious material reaches unprotected skin or mucous membranes while providing patient care.

4.2 Donning

PPE must be donned correctly in proper order before entry into the patient care area and not be later modified while in the patient care area. The donning activities must be directly observed by a trained observer.

4.3 During Patient Care

- PPE must remain in place and be worn correctly for the duration of work in potentially contaminated areas. PPE should not be adjusted during patient care. In the event of a significant splash, the healthcare worker should immediately move to the doffing area to remove PPE. The one exception is that visibly contaminated outer gloves can be changed while in the patient room and patient care can continue. Contaminated outer gloves can be disposed of in the patient room with other Ebola-associated waste.
- HCWs should perform frequent disinfection of gloved hands using an ABHR, particularly after contact with body fluids.
- If during patient care any breach in PPE occurs (e.g., a tear develops in an outer glove, a needlestick occurs, a glove separates from the sleeve), the healthcare worker must move immediately to the doffing area to assess the exposure. The facility exposure

management plan should be implemented; including correct supervised doffing and appropriate occupational health follow-up, if indicated by assessment. In the event of a potential exposure, Bloodborne pathogen exposure procedures must be followed.

4.4 Doffing

- Removing used PPE is a high-risk process that requires a structured procedure, a trained observer, a doffing assistant in some situations, and a designated area for removal to ensure protection.
- PPE must be removed slowly and deliberately in the correct sequence to reduce the possibility of self-contamination or other exposure to Ebola.
- A stepwise process should be developed and used during training and patient care.

4.5 Training on Correct Use of PPE

- HCWs should be required to demonstrate competency in using PPE, including donning and doffing while being observed by a trained observer, before working with patients with Ebola.
- Hospitals should also ensure that employees can demonstrate how to properly don, use, and doff the same type/model PPE and respirators that they will use when caring for a patient.
- Regular refresher trainings are essential to maintaining these skills.

4.6 Use of a Trained Observer

- Because the sequence and actions involved in each donning and doffing step are critical to avoid exposure, a trained observer should read aloud to the healthcare worker each step in the procedure checklist and visually confirm and document that the step has been completed correctly.
- The trained observer must be knowledgeable about all PPE recommended and the correct donning and doffing procedures.
- The trained observer will coach, monitor, and document successful donning and doffing procedures, and provide immediate corrective instruction if the healthcare worker is not following the recommended steps.
- The trained observer is required to wear PPE, nonetheless, because the coaching role will necessitate being present in the PPE removal area during the doffing process. PPE

for the trained observer is described later.

- The trained observer should know the exposure management plan in the event of an unintentional break in procedure.
- However, the trained observer should NOT provide physical assistance during doffing, which would require direct contact with potentially contaminated PPE.
- *A designated doffing assistant or “buddy” might be helpful in some circumstances, e.g., during the doffing of the Powered Air-Purifying Respirator (PAPR).*

4.7 Designating Areas for PPE Donning and Doffing

- Ensure that areas for donning and doffing are designated as separate from the patient care area (e.g., patient’s room) and that there is a predominantly one-way flow from the donning area to the patient care area to the doffing area.
- Confirm that the doffing area is large enough to allow freedom of movement for safe doffing as well as space for a waste receptacle, a new glove supply, and ABHR used during the doffing process. If using a PAPR with external belt-mounted blower, confirm that there is a container designated for collecting PAPR components for cleaning and disinfection, as well as routine maintenance.
- Facilities should ensure that space and layout allow for clear separation between clean and contaminated areas. Separate the space into distinct areas and establish a directional, one-way flow of care, moving from clean areas (e.g., area where PPE is donned and unused equipment is stored) to the patient room and to the PPE removal area (area where potentially contaminated PPE is removed and discarded).
- The direction of flow should be marked (e.g., signs on the floor) with visible signage. Existing anterooms to patient rooms have been used for doffing but in many cases are not ideal because of their small dimensions.
- As an alternative, some steps of the PPE removal process may be performed in a clearly designated area of the patient’s room near the door, provided these steps can be seen and supervised by a trained observer (e.g., through a window) and provided that the healthcare worker doffing PPE can hear the instructions of the trained observer.
- Whenever possible, close the end of the hallway of a ward or ICU, thereby restricting access to the patient’s room to essential personnel who are properly trained in recommended infection prevention practices for caring for patients with Ebola.

- Designate two adjacent rooms, located on either side of the patient's room, to be cleared of equipment and furniture and used as donning and doffing areas. Glass-enclosed rooms or other designs (e.g., wide glass doors, windows, video monitoring) to observe ongoing care in the patient room and activity in the doffing area are preferred.
- The path from the room of the patient with Ebola to an external doffing room should be as short as possible and clearly defined and/or enclosed as a contaminated area that is cleaned frequently along with the doffing area. If areas are reconfigured, the facility should make certain the space remains compliant with all applicable building and fire codes.

Post signage to highlight key aspects of PPE donning and doffing.

4.8 Designate the Following Areas with Appropriate Signage

A. PPE Storage and Donning Area

- This is a clean area outside the patient room (e.g., a nearby vacant patient room, a marked area in the hallway outside the patient room) where clean PPE is stored and where HCWs don PPE before entering the contaminated area and the patient's room.
- Do not store potentially contaminated equipment (e.g., PAPR components that have not been cleaned and disinfected, used PPE, or waste removed from the patient's room in the clean area).
- If waste must pass through this area, it must be properly contained.

B. Patient Room

- Use a single-patient room, preferably with a private bathroom.
- Plan ahead for the need to store many bags of regulated medical waste before their secondary containment.
- The door to the patient room should be kept closed.
- Any item or healthcare worker exiting this room should be considered contaminated.

C. PPE Doffing Area

- Designate an area near the patient's room (e.g., anteroom or adjacent vacant patient room that is separate from the clean area) where HCWs leaving the patient's room can stand to doff and discard their PPE.

- Alternatively, some steps of the PPE removal process may be performed in a clearly designated area of the patient's room near the door, provided these steps can be seen and supervised by a trained observer (e.g., through a window and provided that the healthcare worker doffing PPE can hear the instructions of the trained observer). Do not use this designated area within the patient room for any other purpose.
- Stock gloves in a clean section of the PPE removal area accessible to HCW while doffing.
- Provide supplies to disinfect PPE and perform hand hygiene and space to remove PPE, including an easily cleaned and disinfected seat where HCW can remove boot or shoe covers. If space allows, designate stations around the perimeter of the doffing room where each piece of PPE will be removed, moving from more contaminated to less contaminated areas of the room as PPE is doffed.
- Provide leak-proof disposable infectious waste containers for discarding used PPE.
- Provide a container to collect all reusable PAPR components.
- Frequently clean and disinfect the PPE removal area, including after each doffing procedure has been completed. One way such cleaning may be achieved is by having another HCW who has just donned their full PPE clean the doffing area, moving from cleaner to dirtier areas within the doffing area, before entering the patient's room.
- Facilities should consider making showers available for use for the comfort of HCWs after doffing PPE at the end of their shift; the heat from wearing PPE is likely to cause significant perspiration.

4.9 PPE for Evaluating Persons Under Investigation (PUIs) for Ebola Who Are Clinically Stable and Do Not Have Bleeding, Vomiting, or Diarrhea

While evaluating and managing PUIs who are clinically stable and do not have bleeding, vomiting, or diarrhea, HCWs should at a minimum wear:

- Single-use (disposable) fluid-resistant gown that extends to at least mid-calf or single-use (disposable) fluid-resistant coveralls without integrated hood
- Single-use (disposable) full face shield
- Single-use (disposable) facemask
- Single-use (disposable) gloves with extended cuffs. Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.

Note: *fluid-resistant* gown indicates a gown that has demonstrated resistance to water or a coverall that has demonstrated resistance to water or synthetic blood. In contrast, *impermeable* gowns and coveralls indicates that the material and construction have demonstrated resistance to synthetic blood and simulated bloodborne pathogens

Sequences of donning and doffing of PPE are described in the checklist (appendix 1)

4.10 PPE When Caring for a Patient with Confirmed Ebola or Unstable PUI Who Are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea, Including Procedures for Donning and Doffing PPE

- Airborne transmission of Ebola has not been documented in hospitals or households during any of the human outbreaks investigated to date. However, certain procedures (e.g., bronchoscopy, endotracheal intubation) might create mechanically generated aerosols that could be infectious. Such aerosol-generating procedures require additional precautions.
- It is recommended that all HCWs entering the room of a patient with Ebola wear respiratory protection that would protect them during an aerosol-generating procedure. This would include a NIOSH-certified, fit-tested N-95 or higher respirator, or a Powered Air-Purifying Respirator (PAPR).
- Footwear should be closed-toe, soft-soled, washable, and have a closed back.
- In this guideline, *impermeable* gowns and coveralls indicates that the material and construction have demonstrated resistance to synthetic blood and simulated bloodborne pathogens. In contrast, *fluid-resistant* indicates a gown that has demonstrated resistance to water or a coverall that has demonstrated resistance to water or synthetic blood.

1. Impermeable garment

- **Single-use (disposable) impermeable gown** extending to at least mid-calf.
OR
- **Single-use (disposable) impermeable coverall** without integrated hoods are preferred; coveralls with or without integrated socks are acceptable. Coveralls and gowns should be available in appropriate sizes so people with long arms are able to cover their forearms without gaps between gloves and sleeves when extending their arms to perform normal

duties. Consider selecting gowns or coveralls with thumb hooks to the secure sleeves over the inner glove. Facilities that choose to tape gloves will need to ensure that the tape does not tear the gloves or gown/coverall during doffing and that sharp implements, such as scissors, are not needed to remove the tape. Experience in some facilities suggests that taping can increase risk by making the doffing process more difficult and cumbersome; however, other facilities have identified ways to optimize the use of tape and other adherent materials to anchor sleeves over inner gloves.

Note: Scissors should never be used to remove tape or any other part of PPE.

2. Respiratory Protection should be worn in case a potentially aerosol-generating procedure needs to be performed emergently.

- **N95 Respirator:** Single-use (disposable) N95 respirator or higher in combination with single-use (disposable) surgical hood extending to shoulders and single-use (disposable) full face shield¹. HCWs should be carefully observed to ensure that they do not inadvertently touch their faces under the face shield during patient care.

OR

- **PAPR:** A hooded respirator with a full face shield, helmet, or headpiece. Any reusable helmet or headpiece must be covered with a single-use (disposable) hood that extends to the shoulders and fully covers the neck and is compatible with the selected PAPR.
- If a hood is used over the PAPR, it must not interfere with the function of the PAPR. The facility should follow manufacturer's instructions for decontaminating reusable components and, on the basis of those instructions, develop facility protocols that include designating responsible personnel who ensure that the equipment is safely and appropriately reprocessed and that batteries are fully charged before reuse.
- A PAPR with a self-contained filter and blower unit integrated inside the helmet can facilitate doffing.
- A PAPR with external belt-mounted blower unit requires an additional doffing step, as described below.

3. Single-use (disposable) examination gloves with extended cuffs Two pairs of gloves should be worn. A heavily soiled outer glove can be safely removed /replaced during care. At a minimum, outer gloves should have extended cuffs. Double-gloving allows potentially contaminated outer gloves to be removed during doffing to avoid self-contamination.

4. Single-use (disposable) boot covers that extend to at least mid-calf. In addition, single-use (disposable) ankle-high shoe covers (“surgical booties”) worn over boot covers may be considered to facilitate the doffing process, reducing contamination of the floor in the doffing area thereby reducing contamination of underlying shoes. The facilities may consider methods other than shoe covers worn over boot covers to facilitate doffing of footwear including, most importantly, frequent cleaning of the floor in the doffing area. Boot and shoe covers (if the latter are used) should allow for ease of movement and must not present a slip hazard to the wearer.

5. Single-use (disposable) shoe covers are acceptable to be worn only if they will be used in combination with a coverall with integrated socks.

6. Single-use (disposable) apron that covers the torso to the level of the mid-calf should be used over the gown or coveralls if patients with Ebola are vomiting or have diarrhea, and should be used routinely if the facility is using a coverall that has an exposed, unprotected zipper in the front. Select an apron with a neck strap that can be easily broken or untied to remove without self-contamination when exchanging a soiled apron during care or when removing the apron during the doffing procedure.

Sequences of donning and doffing of PPE are described in the checklist (appendix 2)

4.11 PPE for Trained Observer and Doffing Assistant during Observations or PPE Doffing

- The trained observer should not enter the room of a patient with Ebola but must be in the PPE donning and doffing area to observe donning and doffing procedures.
- Trained observers should don and doff selected PPE according to the same procedure.
- The following PPE are recommended for trained observers and doffing assistants:
 1. Single-use (disposable) fluid-resistant gown that extends to at least mid-calf or single-use (disposable) fluid-resistant coverall without integrated hood.
 2. Single-use (disposable) full face shield.
 3. Single-use (disposable) surgical mask.
 4. Single-use (disposable) gloves with extended cuffs. Two pairs of gloves should be worn. At a minimum, outer gloves should have extended cuffs.

5. Single-use (disposable) ankle-high shoe covers. Shoe covers should allow for ease of movement and not present a slip hazard to the wearer.

- Facilities may elect to use impermeable gowns or coveralls for their trained observers to standardize the PPE, for ease of training personnel on a single item, and to prevent HCWs entering the patient care area from inadvertently selecting a fluid-resistant gown or coverall instead of the recommended impermeable garment. If facilities elect to use fluid-resistant gowns or coveralls for their trained observers, they must take measures (e.g., staff training or clear labeling) to ensure that the correct garment is selected by appropriate personnel.

Sequences of donning and doffing of PPE are described in the checklist (appendix 1)

5. Isolation of Patients

- Single patient room (containing a private bathroom) with the door closed is essential.
- Facilities should maintain a log of all persons entering the patient's room.

6. Duration of Infection Control Precautions

- Duration of precautions should be determined on a case-by-case basis. This should be performed in conjunction with the treating physicians.
- Factors that should be considered include, but are not limited to: presence of symptoms related to EVD, date symptoms resolved, other conditions that would require specific precautions (e.g., *Tuberculosis*, *Clostridium difficile*, multidrug resistant organisms) and available laboratory information.

7. Transfer of Patients

A. Transfers to other departments

- Avoid the movement and transport of patients out of the isolation room.
- Where possible, all procedures and investigations should be carried out in the isolation room with a minimal number of staff present during any procedures.
- The use of designated portable X-ray equipment and other important diagnostic equipment may make this easier.
- Notify in advance the staff of destination department.
- The accompanying HCWs should wear full PPE.

B. Transfer to other institutions

- Refer to appendix 3 - Recommendations for Emergency Medical Services (EMS) and Medical First Responders, Including Firefighters and Law Enforcement
- For dealing with spills of blood or body fluids refer to appendix 4.

8. Patient Care Equipment

- Dedicated medical equipment (preferably disposable, when possible) should be used for the provision of patient care
- All non-dedicated, non-disposable medical equipment used for patient care should be cleaned and disinfected according to manufacturer's instructions and infection control policies.

9. Recommendations for Safely Performing Acute Hemodialysis in Patients with Ebola Virus Disease -See appendix 5

10. Safe Injection Practices

- Facilities should follow policies of Infection Control Directorate for safe injection (2010) and policy for the Prevention and Management of Needle stick Injuries /Blood & Body Fluid Exposure among Healthcare Personnel in Healthcare Setting (2013)
- Limit the use of needles and other sharps as much as possible
- Phlebotomy, procedures, and laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and medical care.
- All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed container.
- Any injection equipment or parenteral medication container that enters the patient treatment area should be dedicated to that patient and disposed of at the point of use.

11. Aerosol Generating Procedures

- Procedures that are usually aerosol generating are: bronchoscopy, Bilevel Positive Airway Pressure (BiPAP), sputum induction, intubation and extubation, and open suctioning of airways.
- Avoid aerosol generating procedures for EVD patients.
- Use a combination of measures (contact, droplet, and airborne) to reduce exposures from

aerosol-generating procedures.

- Visitors should not be present during aerosol-generating procedures.
- Limiting the number of HCWs present during the procedure to only those essential for patient-care and support.
- Conduct the procedures in an Airborne Infection Isolation Room (AIIR). Room doors should be kept closed during the procedure except when entering or leaving the room, and entry and exit should be minimized during and shortly after the procedure.
- HCWs should wear full PPE during aerosol generating procedures.
- Conduct environmental surface cleaning following procedures.
- If re-usable equipment or PPE (e.g. PAPR, elastomeric respirator, etc.) are used, they should be cleaned and disinfected by responsible trained individuals according to manufacturer instructions and hospital policies.
- Because of the potential risk to individuals reprocessing reusable respirators, disposable filtering face piece respirators are preferred.

12. Visits

- Avoid entry of visitors into the patient's room.
- Exceptions may be considered on a case by case basis for those who are essential for the patient's wellbeing.
- Visitor should consult with the nurse in charge -if allowed- before entry into the isolation area.
- Visits should be scheduled and controlled (e.g., logbook) to allow for:
 - o Screening for EVD (e.g., fever and other symptoms) before entering or upon arrival to the hospital
 - o Evaluating risk to the health of the visitor and ability to comply with precautions
 - o Providing instruction, before entry into the patient care area on hand hygiene, limiting surfaces touched, and use of PPE according to the current facility policy while in the patient's room
- Visitor movement within the facility should be restricted to the patient care area and an immediately adjacent waiting area.
- Visitors should not be present during aerosol-generating procedures.

N.B. Visitors who have been in contact with the EVD patient before and during hospitalization are a possible source of EVD for other patients, visitors, and staff.

13. Handling Laboratory Specimens

- Laboratories should be notified about the samples.
- All specimens should be regarded as highly infectious.

A. PPE

- Laboratory workers shall use PPE to prevent transmission of infectious pathogens during the collection, processing, and testing of patient specimens.
- PPE must prevent blood or other potentially infectious materials from passing through and reaching the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes
- PPE selected must not be compromised by chemicals used in laboratory procedures
- Consideration may be given to using a buddy system to ensure that safe donning and doffing procedures are followed
- Laboratory staff **must** be trained in the proper donning and doffing of PPE

PPE during specimen collection

- HCWs including laboratory staff who collect patient specimens from a confirmed patient or a PUI exhibiting obvious bleeding, vomiting or diarrhea or who is clinically unstable and/or will require invasive or aerosol-generating procedures, should wear the PPE as described above while caring for unstable patients described in section 4.10.

PPE when performing laboratory testing

- When manipulating clinical specimens when EVD is a concern, staff should use a combination of engineering controls, work practices and PPE to protect their mouth, nose, eyes and bare skin from coming into contact with patient specimens, including:
 - Disposable gloves
 - Solid-front wrap around gowns that are fluid-resistant or fluid-impermeable
 - Surgical mask to cover all of nose and mouth
 - Eye protection such as a full face shield or goggles/safety glasses with side shields

- When removing PPE, follow the proper sequence (**appendix 2**)
- Clinical laboratories may decide to include additional PPE that may necessitate additional requirements, (i.e., staff must be fit tested and medically cleared to wear an N-95 respirator).

B. Laboratory Testing and Equipment

- It is strongly recommended to work inside a certified Class I or certified Class II biosafety cabinet (BSC) when handling or manipulating patient specimens.
- Consider manufacturer-installed safety features for instruments that reduce the likelihood of exposure
- Consider using equipment with closed tube systems in which the specimen container (e.g., vacutainer tube) stays capped during testing.
- If centrifugation is necessary, centrifuges should have sealed buckets or sealed rotors. After centrifugation, the sealed buckets or rotors should be opened inside a biosafety cabinet.
- If automated blood culture instruments have been used, after careful evaluation of the risk assessment, ensuring that the outside of the bottle is cleaned with an appropriate disinfectant before putting it in the instrument, and ensuring that staff who handle the bottles are wearing gloves.
- If benchtop blood culture instruments or blood culture bottles incubated manually in separate incubators and monitored for turbidity as an indication of growth. Subculture of any positive blood culture bottles should be performed within a biosafety cabinet in a separate laboratory area segregated from the core lab, preferably by using commercially available “venting unit” devices that sheath the needle during extraction of blood from the bottle to prevent needlesticks.
- Automated hematology analyzers with a closed tube system have been used in the core lab after careful evaluation of the risk assessment, ensuring that the outside of the tube is cleaned with an appropriate disinfectant before running the sample on the instrument, and ensuring that staff who handle the specimens are wearing risk assessment-defined PPE. Alternatively, benchtop moderate complexity closed tube hematology analyzers are also available for laboratories electing to perform laboratory testing in a Point of Care (POC) location.

Point of Care (POC) Testing

- It is recommended to place point of care (POC) instruments within an enclosure or behind a barrier to contain any splashes or potential aerosols that may be generated.
 - o If placed inside a BSC, ensure that appropriate airflow is not compromised by overloading the inside of the BSC, or by blocking the front or back air intake grilles. Consideration should be given to verifying inward airflow at the front opening of the BSC while instruments are operating.
 - o When a BSC is not available or possible, then additional safety equipment should be used to contain any splashes or potential aerosols generated. This could be a small benchtop BSC, a PCR workstation (e.g., “dead air box”), a plexiglass splash shield, or other physical containment device.
- If clinical laboratories decide to add POC instruments specifically for testing specimens from PUIs, staff should be trained and should practice these procedures in advance while wearing the appropriate PPE.

C. Transporting Patient Specimens

Within the Facility

- Primary specimen containers should only be handled with proper PPE.
- PPE to be worn during transport within the facility should be determined by a site-specific risk assessment.
- Recommendations for PPE include disposable fluid-resistant gown, disposable gloves, covered legs and closed-toed shoes.
- The outside of blood collection tubes should be wiped off with an appropriate disinfectant.
- Specimens should be placed in a durable, leak-proof secondary container for transport within a facility.
- After placement in a secondary container, specimens should be hand-carried to the laboratory. Do not use any pneumatic tube system for transporting suspected specimens to reduce the risk of breakage or leaks.
- Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.

- Before removing specimens from the site of care, it is advisable to plan the route of the sample from the patient area to the packing location for shipping to avoid high traffic areas.

Outside of the Facility

- Ebola virus is classified as a Category A infectious substance. Specimens from PUIs or patients confirmed to have Ebola virus infection should be packaged and shipped as **Category A infectious** substances.
- Specimens for transport outside the facility should be packaged following the basic **triple packaging** system which consists of a primary container (a sealable specimen bag) wrapped with absorbent material, secondary container (watertight, leak-proof), and an outer shipping package.
- Specimens collected for Ebola virus testing should be packed and shipped without attempting to open collection tubes or aliquot specimens. Opening the tubes destroys the vacuum seal and thus increases the risk of leakage during transport.

D. Decontamination of Equipment

- For decontamination of laboratory instruments and equipment, the laboratory should consult in advance with the manufacturer to ensure the most appropriate selection of disinfectants and their use on the equipment for cleaning and decontamination
- Consult the manufacturer when taking the equipment out of commission or preparing for maintenance or repairs.
- If an instrument is contaminated during use and there is no procedure for decontamination of the internal compartments without compromising the instrument operability, then the instrument may need to be removed from service as there are no other validated methods for ensuring that any remaining viral particles are no longer viable.

E. Laboratory Waste Management

- For solid waste generated during laboratory testing:
 - o Potentially infectious materials shall be placed in a primary container that prevents leakage during collection, handling, processing, storage, transport, or shipping

- The primary container shall be placed within a second container that is puncture-resistant and prevents leakage during handling, processing, storage, transport, or shipping
- For offsite transportation, laboratory waste should be triple packed.
- If available and proper procedures are strictly adhered to, steam sterilization (autoclaving) as a waste treatment process will inactivate the virus. If used, there are numerous requirements that must be followed for the safe and effective operation of autoclaves. After waste has been autoclaved, it can be combined with the laboratory waste stream as regulated (non-class A) medical waste.
- If an autoclave is not available in the facility, other arrangements must be made to transport, treat, and dispose of the waste.

14. Environmental Control

- Diligent environmental cleaning and disinfection and safe handling of potentially contaminated material is paramount, as blood, sweat, emesis, feces and other body secretions represent potentially infectious materials.
- HCWs performing environmental cleaning and disinfection should wear the recommended PPE.
- Be sure staff are instructed in the proper use of PPE including safe removal to prevent contaminating themselves or others in the process, and that contaminated equipment is disposed of appropriately.
- Use an approved hospital disinfectant with a label claim for a non-enveloped virus (norovirus, rotavirus, adenovirus, poliovirus) to disinfect environmental surfaces in rooms of PUIs or patients with confirmed EVD.
- If reusable heavy-duty gloves are used for cleaning and disinfecting, they should be disinfected and kept in the room or anteroom.
- Do not place PUIs or patients with confirmed EVD in carpeted rooms.
- Remove all upholstered furniture and decorative curtains from patient rooms before use.
- Routine cleaning and disinfection of the PPE doffing area. Routine cleaning of the PPE doffing area should be performed at least once per day and after the doffing of grossly contaminated PPE. Cleaning should be performed by a HCW wearing clean PPE. When

cleaning and disinfection are complete, the healthcare worker should carefully doff PPE and perform hand hygiene.

- Cleaning should be performed only by nurses as part of patient care activities in order to limit the number of additional HCWs who enter the room.
- Avoid contamination of **reusable porous surfaces** that cannot be made single use: Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
- Follow standard procedures for cleaning and/or disinfection of blood and body fluid spillage. See appendix (4).

Handling Spills

The basic principles for blood or body substance spill management are:

1. Removal of bulk spill material,
2. Cleaning the site,
3. and then disinfecting the site with a Ministry Approved Hospital Disinfectant with label claims for non-enveloped viruses (norovirus, rotavirus, adenovirus, poliovirus) provided with clear instructions for cleaning and decontaminating of surfaces or objects soiled with blood or body fluids.

Points to consider are:

- Limit the number of personnel involved in the clean-up
- Develop protocols for safely remediating spills containing broken glass
- Before any spill clean-up is initiated, ensure staff are trained and wear recommended PPE to protect against direct skin and mucous membrane exposure of cleaning chemicals, contamination, and splashes, including, at a minimum:
 - o Disposable gloves
 - o Solid-front wrap-around gowns that are fluid-resistant or fluid-impermeable
 - o N-95 rated respirator (staff must be fit tested and medically cleared), or surgical mask to cover all of nose and mouth
 - o Eye protection such as a full face shield or goggles/safety glasses with side shields
- All materials used for cleanup must be treated as infectious and disposed of in a biohazard waste container. For details see Environmental Cleaning and Disinfection Policy 2009.

Food service

All patient food utensils shall be disposable.

Linen

Discard all linens, non-fluid-impermeable pillows or mattresses, and textile privacy curtains in triple packs to be transported for incineration.

15. Ebola-associated Waste Management

- Waste generated in the care of PUIs or patients with confirmed EVD and waste contaminated (or suspected to be contaminated) with Ebola virus is a Category A infectious substance regulated as a hazardous material.
- Ebola-associated waste that has been appropriately incinerated, autoclaved, or otherwise inactivated is not infectious, does not pose a health risk, and is not considered to be regulated medical waste.

Main Principles

1. Safe containment and packaging of waste should be performed as close as possible to the point of generation. Staff should avoid opening containers to manipulate the waste after primary containment.
2. Limit the number of personnel entering the Ebola patient care area and those handling generated waste before and after primary containment.
3. Always use appropriate personal protective equipment (PPE) and procedures for handling waste until onsite inactivation or transport away from the hospital for offsite inactivation.

Preparing a Waste Management Plan as Part of Ebola Patient Care

- Determine whether Ebola-associated waste will be inactivated onsite at the hospital or transported offsite for inactivation.
- Identify a dedicated waste management team with specific training on standardized procedures for waste handling, including wearing appropriate PPE, and protocols for safely bagging and packaging waste, storing waste, and transporting packaged waste.

- Onsite inactivation: Ebola-associated waste may be inactivated through incineration or by autoclaving using properly maintained equipment with appropriate biological indicators.
 - Offsite inactivation: Comply with regulations for packaging, transport and disposal of Ebola-associated waste.
- When selecting emergency department triage areas for the evaluation of patients with possible Ebola, a designated area should be identified for waste storage pending a determination of whether the patient has Ebola or not. The storage space should meet all applicable principles of maintaining a safe environment. Follow the same procedure outlined later.

Supplies for Hand Hygiene, Cleaning and Disinfection, and Packaging Waste

- Leak-proof labeled biohazard bags
 - Approved sharps waste container
 - Waste container in patient's room
 - Transport cart
 - Absorbent disposable towels
 - Ministry-registered hospital disinfectant for use against the Ebola virus
 - Disposable cleaning cloths
 - Alcohol-based hand rub (ABHR) that is at least 60% alcohol
 - Rigid outer receptacle that conforms to the requirements for transport of Category A waste provided by approved waste vendor.
- Outer package must be either a rigid United Nations Standard- or DOT-approved non-bulk packaging. If the outer packaging is fabricated from fiberboard, it must be a minimum of triple wall and contain a 6 mil polyethylene liner..
- Waste should be packaged with an installed liner provided by the waste vendor.
- Absorbent material sufficient to absorb potential free liquid (if any) should be placed in the bottom of the rigid outer packaging or the liner of the fiberboard outer packaging.

i) Procedures for handling solid waste

A. Primary Packaging of Medical Waste in Patient's Room

Examples of solid waste include medical equipment, sharps, linens, privacy curtains, and used healthcare products (such as soiled absorbent pads or dressings, kidney-shaped emesis pans, portable toilets, used PPE [gowns, masks, gloves, goggles, face shields, respirators, booties, etc.] or byproducts of cleaning).

All placement of receptacles (including sharps containers) and primary packaging by double-bagging of waste should occur in the patient's room and be performed by the primary HCWs (i.e., nurses) wearing PPE as designated .

1. Line appropriate-sized waste containers with a leak-proof biohazard bag.
2. Place non-sharps solid waste in the biohazard bag. Bags should not be filled beyond two thirds full to allow safe closure.
3. Carefully place sharps waste in appropriate disposable sharps container and close the container. Containers should not be filled beyond two thirds full to allow safe closure.
4. Prepare filled bags and sharps containers for **onsite inactivation (step 5) or offsite inactivation/incineration (step 6)**.
5. Prior to closure of bag and sharps container, prepare waste for **onsite autoclaving**:
 - Non-sharps waste: if required by the validated procedures, add a sufficient volume of water to primary bag.
 - Sharps waste: if required by the validated procedures, add sufficient volume of water.
6. For **offsite inactivation**, no liquid should be added.
7. Place closed sharps containers in a biohazard bag.
8. Close the bag with a method that will not tear or puncture the bag (e.g., tying the neck of bag with a goose-neck knot) and will ensure no leaks.
9. Apply Ministry-approved hospital cleaner/disinfectant (wipe or spray) to the outside surface of the closed bag.
10. Place the wiped/sprayed closed bag into a second biohazard bag.
11. Close the bag with a method that will not tear or puncture the outer bag and will ensure no leaks (e.g., tying the neck of bag with a knot).
12. Apply Ministry- approved hospital cleaner/disinfectant (wipe or spray) to the outside surface of the secondary bag.
13. Store the disinfected closed bags in a designated area to await removal.
14. Follow recommended procedures for taking off PPE.

B. Secondary Packaging and Removal of Waste

1. The HCWs (nurses) caring for the patient and wearing PPE as designated in the guidance for hospitals should spray or wipe the outside surfaces of double-bagged waste with Ministry- approved hospital disinfectant immediately before removing waste from the room.
2. Upon removing the double-bagged waste from the patient's room, the healthcare worker should place the double-bagged waste in a designated transport cart (for onsite inactivation or a rigid outer receptacle (with absorbent material and liner for offsite inactivation)).
3. The designated container should be located at the periphery of the area for taking off PPE so that removal from the area is efficient and does not create a risk of recontamination of the outer container.
4. Hotel services personnel removing the waste from the care area should only handle the outer container/transport cart and should never open the container or handle the double-bagged waste. PPE should be used appropriately.
5. **For onsite inactivation, hotel services personnel wearing appropriate PPE should:**
 - Safely transfer waste in a transport cart to dedicated waste autoclave room or secured storage location.
 - Inactivation of Ebola virus in waste can be achieved by treating materials suspected of being contaminated with Ebola in an autoclave under a "validated waste cycle" to 121°C for at least 30 minutes or by incineration at extremely high temperatures (Incineration would be the best method for large or bulky items, such as mattresses).
6. **For offsite inactivation:**
 - Before removal from the area, the HCWs wearing appropriate PPE should close the liner (either by zip tie or similar means of closure as specified by the manufacturer of the packaging), and close the outer lid and packaging. Disinfect the entire exterior surface of the container with a Ministry-registered hospital disinfectant (wipe or spray).
 - Hotel services personnel wearing appropriate PPE should secure the outer lid and packaging and apply the special "Category A DOT Waste" labels as directed by the manufacturer of the packaging.

- Safely transport to a designated and secure storage area that is preferably isolated and with limited access for approved waste vendor pickup.

ii) Procedures for Handling Liquid Waste (Body Fluids Including Blood, Urine, Vomit, Feces)

- Comply with local regulations regarding pretreatment of waste.
- Sanitary sewers may be used for the safe disposal of patient waste if the water treatment is performed nationwide.
- Primary handling of liquid waste should occur in the patient's room and be performed by the primary HCWs (i.e., nurses) wearing recommended PPE as follow:
 1. Pour waste, avoiding splashing by pouring from a low level, into the toilet.
 2. Close the lid first, and then flush toilet.
 3. Clean and disinfect flush handles, toilet seat, and lid surfaces with Ministry-registered hospital disinfectant/cleaner.
 4. Discard cleaning cloths in biohazard bags.
 5. Discard emesis and portable toileting containers as solid waste.
 6. Follow recommended procedures for removal of PPE.

16. Human Remains

Key Points

- Ebola virus can be transmitted in postmortem care settings through unsafe handling of remains.
- Ensure that only personnel trained in handling infected human remains and wearing recommended PPE touch or move any remains that contain Ebola virus.
- Do not wash or clean the body.
- Do not embalm the body.
- Do not perform an autopsy. If an autopsy is necessary, consult the Ministry, Infection Control and Preventive Health Department regarding necessary precautions.
- Do not remove any inserted medical equipment from the body such as intravenous (IV) lines, endotracheal or other tubing, or implanted electronic medical devices.
- The body should be buried in a standard metal casket or other comparable burial method.
- If a hospital has a patient with EVD, hot and cold safety zones should already be established.

- **Hot zone** – contaminated area that includes the patient treatment room. Only workers wearing PPE that conforms to guidance on PPE for HCWs are allowed to be in this area.
- **Cold zone** – non contaminated area used for planning and staging. Only workers who have not entered the hot zone or who have properly doffed their PPE after being in the hot zone are permitted in the cold zone. Workers put on clean PPE in the cold zone under the direction of a trained observer.

Equipment List

The following equipment should be used in the hot zone:

- Hospital gurney containing three pre-opened body bags with the following specifications:
 - First bag (top layer on gurney): to prevent any leakage of fluids
 - Second bag (middle layer on gurney): for the containment and transport of infectious bodies.
 - Third bag (bottom layer on gurney): to prevent any leakage of fluids
- Thermal sealer for sealing the second bag
- PPE recommended for personnel entering the room of a patient with EVD as described before.
- Scissors for cutting excess material from heat-sealed bag
- Camera or mobile phone capable of securely transferring photographs electronically.
- An approved hospital disinfectant and wipes with a label-claim for use against a non-enveloped virus
- Alcohol-based hand rub (ABHR)
- Biohazard bag for medical waste
- Zip tie for locking the third bag shut at the zipper

The following equipment should be used in the cold zone:

- Hospital gurney or mortuary stretcher
- Adhesive-backed pouch that is applied to the decontaminated body bag
- Single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown
- Biohazard spill kit, including: recommended PPE, absorbent materials such as paper towels, kitty litter or a solidifier, an approved hospital disinfectant, and biohazard waste bags

- Infectious substance labels that are applied to the decontaminated body bag. These include the following:
 - “infectious substance” label
 - “Do not open” label
 - Name and phone number of the hospital administrator

Postmortem Preparation in a Hospital Room

- Ensure that workers handling the body and the trained observer wear the recommended PPE and follow all of the procedures of donning/doffing.
- Follow the cleaning and disinfecting recommendations of PPE surfaces, equipment, or patient care area surfaces that become visibly soiled should be decontaminated immediately using an approved disinfectant with a label claim for use against a non-enveloped virus.
- Place all waste produced during postmortem preparation and decontamination into biohazard bags in the hot zone, following the guidelines for Ebola-associated waste management.

Step-by-step Guidelines for Postmortem Preparation

- It is intended to protect workers involved in the postmortem preparation of the body in a hospital setting.
- The number of workers needed for this process will be determined by the size and weight of the body being prepared and the ability of the workers to lift the body and assist with managing the body bag. For the death of an average size adult, for example, this process should be performed by a minimum of three healthcare workers or other workers properly trained in handling infectious bodies: two to lift the body and one to hold the body bag open.
- It is recommended to post an enlarged copy of appendix (6) in the hot zone. The workers should read the guidelines aloud as they perform each step of the procedure.
- After following the 21 step (appendix 6), the body bag has been decontaminated, and the potential for further contamination has been eliminated as long as the body is handled carefully. Workers who handle the body bag from this point until the body is placed into a metal casket should wear single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown; other PPE is optional.

- If there is no evidence that the body bag has been compromised by a tear or puncture or liquid coming from the bag, surfaces that contact the body bag should not be considered contaminated, and gloves and disposable gowns used for transport can be disposed of as regular trash. See appendix 6 for step-by-step guidelines.

Transportation of Human Remains

- Ensure that anyone handling the body bag wears single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown.
- 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.

Step-by-step Guidelines for Transportation of Remains

- The transportation of human remains from the cold zone in the hospital to the place of final disposition should be performed by a minimum of two healthcare or mortuary workers.
 - A plan should be in place to transport the body safely from the hospital to the hearse or vehicle used to transport the body. For example, the plan should include a pre-identified route through the hospital that is secure and either free of or with limited patient and personnel traffic. The route should take the body directly to a pre-identified hearse or vehicle to transport the body.
 - A hospital or public health official should be designated in advance to accompany the body from the hospital to the place of final disposition to ensure the safety of all those involved in the process. There should be protocols in place so the designated official accompanying the body knows what to do if the body bag is compromised during transport and how to safely decontaminate it. For example, this official should have a biohazard spill kit with all of the equipment needed for any situation in which the body bag is compromised, including: recommended PPE, absorbent materials such as paper towels, kitty litter or a solidifier, hospital disinfectant, additional body bags, and biohazard waste bags.
1. A new set of workers in the cold zone will receive the decontaminated body bag.
 2. Place patient identification and any other documents that need to accompany the body, including a printout of the photograph taken before the body was bagged, in an adhesive-backed pouch that is attached to the body bag. This will serve the function of toe tags. This

should be done after the bagged body enters the cold zone but before the bagged body is transported to the morgue or out of the hospital.

3. Notify the mortuary if the body has any implanted electronic medical devices.
4. Affix the following labels to the body bag before it is placed into the hearse or other vehicle used to transport the body:
 - “infectious substance” label
 - United Nations (UN) 2814 label
 - “Do not open” label
 - Name and phone number of the hospital administrator
5. Transport the body using a pre-identified hearse or vehicle to a pre-identified place of final disposition using a pre-identified route.

Mortuary Care and Disposition of Remains

The guidance below is primarily intended to protect workers involved with the disposition of human remains either by cremation (recommended) or burial.

- Ensure that anyone handling the body bag wears single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown.
- Do not open the body bags.
- Do not embalm the body.
- Do not remove any implanted medical devices.
- The body should be buried in a standard metal casket or other comparable burial method in accordance with local burial requirements. The casket containing the bagged remains can be handled without PPE.

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V. Appendices

Appendix (1) Checklist of PPE while Caring for Persons Under Investigation (PUIs) for Ebola Who Are Clinically Stable and Do Not Have Bleeding, Vomiting, or Diarrhea

A. Donning PPE

Hospital:.....Location:
 Date:Time:
 Name of HCW:

This donning procedure applies to PPE recommended for evaluating and managing PUIs who are clinically stable and do not have bleeding, vomiting, or diarrhea. There is a lower risk of splashes and contamination in these situations. An established protocol, combined with proper training of the healthcare worker (HCW), helps to facilitate compliance with PPE guidance.

Step	Performance	
	Yes	No
1. Remove Personal Clothing and Items: The HCW should wear surgical scrubs. No personal items (e.g., jewelry [including rings], watches, cell phones, pagers, pens) should be worn under PPE or brought into the patient room. Long hair should be tied back. Eye glasses should be secured with a tie.		
2. Inspect PPE Prior to Donning: Visually inspect the PPE ensemble to ensure that it is in serviceable condition (e.g., not torn or ripped), that all required PPE and supplies are available, and that the sizes selected are correct for the HCW.		
3. Perform Hand Hygiene: Perform hand hygiene with alcohol based hand rub (ABHR). When using ABHR, allow hands to dry before moving to next step.		
4. Put on Inner Gloves: Put on first pair of gloves		
5. Put on Gown or Coverall: Put on gown <i>or</i> coverall. Ensure gown <i>or</i> coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the gown <i>or</i> coverall.		
6. Put on face mask: Put on facemask		
7. Put on Outer Gloves: Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown <i>or</i> coverall.		
8. Put on Face Shield: Put on full face shield over the surgical facemask to protect the eyes, as well as the front and sides of the face.		
9. Verify: After completing the donning process, the integrity of the ensemble should be verified by the HCW (e.g., there should be no cuts or tears in the PPE). The HCW should be comfortable and able to extend the arms, bend at the waist, and go through a range of motions to ensure there is sufficient range of movement while all areas of the body remain covered. A mirror in the room can be useful for the HCW while donning PPE.		

Name of The observer:

Signature:

B. Doffing PPE

Hospital:.....**Location:**
Date:**Time:**
Name of HCW:

PPE is doffed in the designated PPE removal area in the healthcare facility. As with all PPE doffing, meticulous care should be taken to avoid self-contamination. Place all PPE waste in a leak-proof infectious waste container

Step	Performance	
	Yes	No
1. Inspect: Inspect the PPE for visible contamination, cuts, or tears before starting to remove. If any PPE is visibly contaminated, disinfect by using an approved. If the facility conditions permit and appropriate regulations are followed, an Approved disinfectant spray can be used, particularly on contaminated areas.		
2. Disinfect and Remove Outer Gloves: Disinfect outer-gloved hands with either an approved disinfectant wipe or ABHR. Remove and discard outer gloves, taking care not to contaminate inner gloves when removing the outer gloves. Dispose of outer gloves into the designated leak-proof infectious waste container.		
3. Inspect and Disinfect Inner Gloves: Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears. If an inner glove is visibly soiled, then disinfect the glove with either an approved disinfectant wipe or ABHR, remove the inner gloves, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. If a cut or tear is seen on an inner glove, immediately review occupational exposure risk per hospital protocol. If there is no visible contamination and no cuts or tears on the inner gloves, then disinfect the inner-gloved hands with either an approved disinfectant wipe or ABHR.		
4. Remove Face Shield: Remove the full face shield by tilting the head slightly forward, grabbing the rear strap and pulling it over the head, gently allowing the face shield to fall forward. Avoid touching the front surface of the face shield. Discard the face shield into the designated leak-proof infectious waste container.		
5. Disinfect Inner Gloves: Disinfect inner gloves with either an approved disinfectant wipe or ABHR.		

<p>6. Remove Gown or Coverall: Remove and discard.</p> <ul style="list-style-type: none"> a. Depending on gown design and location of fasteners, the HCW can either untie fasteners or gently break fasteners. Avoid contact of scrubs or disposable garments with outer surface of gown during removal. Pull gown away from body, rolling inside out and touching only the inside of the gown. b. To remove coverall, tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely before rolling down while turning inside out. Avoid contact of scrubs with outer surface of coverall during removal, touching only the inside of the coverall. Dispose of gown or coverall into the designated leak-proof infectious waste container 		
<p>7. Disinfect and Change Inner Gloves: Disinfect inner gloves with either an approved disinfectant wipe or ABHR.</p> <ul style="list-style-type: none"> a. Remove and discard gloves, taking care not to contaminate bare hands during removal process. b. Perform hand hygiene with ABHR. c. Don a new pair of inner gloves. 		
<p>8.Remove Surgical Facemask: Remove the surgical facemask by tilting the head slightly forward, grasping first the bottom tie or elastic strap, then the top tie or elastic strap, and remove the front of the surgical facemask without touching it. Discard the surgical face mask into the designated leak-proof infectious waste container.</p>		
<p>6. Disinfect and Remove Inner Gloves: Disinfect inner-gloved hands with either an approved disinfectant wipe or ABHR. Remove and discard gloves, taking care not to contaminate bare hands during removal process. Dispose of inner gloves into the designated leak-proof infectious waste container</p>		
<p>7. Perform Hand Hygiene: Perform hand hygiene with ABHR</p>		
<p>8. Inspect: The HCW should inspect for any contamination of the surgical scrubs or disposable garments. If there is contamination, shower immediately, and then immediately inform the infection preventionist or occupational safety and health coordinator or their designee.</p>		

Name of The observer:

Signature:

Appendix (2) Checklist for Donning and Doffing of PPE When Caring for a Patient with Confirmed Ebola or PUI Who Are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea

A1. Donning PPE, PAPR Option

Hospital:.....**Location:**.....
Date:**Time:**
Name of HCW:

For the trained observer

- You should confirm visually that all PPE is serviceable and has been donned successfully.
- You should review the donning sequence with HCW before HCW begins the donning process and reads it to the HCW in a step-by- step fashion during donning and verify the integrity of the ensemble.
- No exposed skin or hair of the healthcare worker should be visible at the conclusion of the donning process

Step	Performance	
	Yes	No
1. Remove Personal Clothing and Items: Change into surgical scrubs and dedicated washable (plastic or rubber) shoes in a suitable clean area. No personal items (e.g., jewelry, watches, cell phones, pagers, pens) should be brought into patient room. Long hair should be tied back. Eye glasses should be secured with a tie.		
2. Inspect PPE Prior to Donning: Visually inspect the PPE ensemble to be worn to ensure that it is in serviceable condition, that all required PPE and supplies are available, and that the sizes selected are correct for the healthcare worker.		
3. Perform Hand Hygiene: Perform hand hygiene with alcohol based hand rub (ABHR). When using ABHR, allow hands to dry before moving to next step.		
4. Put on Boot Covers: If a coverall without integrated socks is worn, the upper band of the boot cover will be worn UNDER the pants leg of the coverall to prevent pooling of liquids between the coverall pants leg and upper band of boot cover. This step can be omitted if wearing a coverall with integrated socks.		
5. Put on Inner Gloves: Put on first pair of gloves.		
6. Put on Gown or Coverall: Put on gown <i>or</i> coverall. Ensure gown or coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the gown <i>or</i> coverall <ul style="list-style-type: none"> a. If a PAPR with a self-contained filter and blower unit that is integrated inside the helmet is used, then the belt and battery unit must be put on prior to donning the impermeable gown <i>or</i> coverall so that the belt and battery unit are contained under the gown <i>or</i> coverall. b. If a PAPR with external belt-mounted blower is used, then the blower and tubing must be on the outside of gown <i>or</i> coverall to ensure proper airflow. 		
7. Put on Outer Gloves: Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown <i>or</i> coverall		

<p>8. Put on Respirator: Put on PAPR with full face-shield, helmet or headpiece</p> <ul style="list-style-type: none"> a. If a PAPR with a self-contained filter and blower unit integrated inside the helmet is used, then a single-use (disposable) hood that extends to the shoulders and fully covers the neck must also be used. Be sure that the hood covers all of the hair and the ears, and that it extends past the neck to the shoulders. b. If a PAPR with external belt-mounted blower unit and attached reusable headpiece is used, then a single-use (disposable) hood that extends to the shoulders and fully covers the neck must also be used. Be sure that the hood covers all of the hair and the ears, and that it extends past the neck to the shoulders 		
<p>9. Put on Outer Apron (if used): Put on full-body apron to provide additional protection to the front of the body.</p>		
<p>10. Verify: After completing the donning process, the integrity of the ensemble is verified by the trained observer. The healthcare worker should be comfortable and able to extend the arms, bend at the waist, and go through a range of motions to ensure there is sufficient range of movement while all areas of the body remain covered. A mirror in the room can be useful for the healthcare worker while donning PPE.</p>		

Name of The observer:

Signature:

A2. Donning PPE, N95 Respirator Option

Hospital:.....Location:.....
 Date:Time:
 Name of HCW:

For the trained observer

- You should confirm visually that all PPE is serviceable and has been donned successfully.
- You should review the donning sequence with HCW before HCW begins the donning process and reads it to the HCW in a step-by- step fashion during donning and verify the integrity of the ensemble.
- No exposed skin or hair of the healthcare worker should be visible at the conclusion of the donning process

Step	Performance	
	Yes	No
1. Remove Personal Clothing and Items: Change into surgical scrubs and dedicated washable (plastic or rubber) shoes in a suitable, clean area. No personal items (e.g., jewelry, watches, cell phones, pagers, pens) should be brought into patient room. Long hair should be tied back. Eye glasses should be secured with a tie		
2. Inspect PPE Prior to Donning: Visually inspect the PPE ensemble to be worn to ensure it is in serviceable condition, all required PPE and supplies are available, and that the sizes selected are correct for the healthcare worker.		
3. Perform Hand Hygiene: Perform hand hygiene with alcohol based hand rub (ABHR). When using ABHR, allow hands to dry before moving to next step.		
4. Put on Boot Covers: If a coverall without integrated socks is worn, the upper band of the boot cover will be worn UNDER the pants leg of the coverall to prevent pooling of liquids between the coverall pants leg and upper band of boot cover. This step can be omitted if wearing a coverall with integrated socks.		
5. Put on Inner Gloves: Put on first pair of gloves		
6. Put on Gown or Coverall: Put on gown <i>or</i> coverall. Ensure gown <i>or</i> coverall is large enough to allow unrestricted freedom of movement. Ensure cuffs of inner gloves are tucked under the sleeve of the gown <i>or</i> coverall.		
7. Put on N95 Respirator: Put on N95 respirator. Complete a user seal check		
8. Put on Surgical Hood: Over the N95 respirator, place a surgical hood that covers all of the hair and the ears, and ensure that it extends past the neck to the shoulders. Be certain that hood completely covers the ears and neck		
9. Put on Outer Apron (if used): Put on full-body apron to provide additional protection to the front of the body.		
10. Put on Outer Gloves: Put on second pair of gloves (with extended cuffs). Ensure the cuffs are pulled over the sleeves of the gown <i>or</i> coverall.		
11. Put on Face Shield: Put on full face shield over the N95 respirator and surgical hood to protect the eyes, as well as front and sides of the face.		
12. Verify: After completing the donning process, the integrity of the ensemble is verified by the trained observer. The healthcare worker should be comfortable and able to extend the arms, bend at the waist and go through a range of motions to ensure there is sufficient range of movement while all areas of the body remain covered. A mirror in the room can be useful for the healthcare worker while donning		

Name of The observer:

Signature:

B1. Doffing PPE, PAPR Option

Hospital:.....
 Location:.....
 Date:..... Time:.....
 Name of HCW:

Preparing for Doffing

- The doffing area should be separated into areas where early and later steps of doffing are conducted (e.g., separate chairs or ends of a bench).
- Before entering the PPE removal area, look for, clean, and disinfect (using approved disinfectant wipe) visible contamination on the PPE.
- As a final step before doffing, disinfect outer-gloved hands with either approved disinfectant or ABHR, and allow to dry.
- Verify that the trained observer is available in the PPE removal area before entering and beginning the removal process.
- If using PAPRs, it might be helpful to have a designated assistant to help with doffing.
- An assistant who is only assisting in doffing should wear the same PPE as the trained observer.
- If the doffing assistant is entering the patient’s room (e.g. as a clinician), the assistant should wear the same PPE as other personnel entering the patient’s room.
- The observer should not touch the person who is doffing and should not serve as the doffing assistant or “buddy.”
- A mirror in the room can be useful for the healthcare worker while doffing PPE.
- PPE should be doffed in the designated PPE removal area. Place all PPE waste in a leak-proof infectious waste container.

For the Trained Observer

- The doffing process is conducted under your supervision
- The doffing process should be supervised by the trained observer, who reads aloud each step of the procedure and confirms visually that the PPE is removed properly. Before the healthcare worker doffs PPE, the trained observer should coach and remind the healthcare worker to avoid reflexive actions that may put them at risk, such as touching their face.
- Post this instruction and repeat it verbally during doffing.

Step	Performance	
	Yes	No
1. Inspect: Inspect the PPE to assess for visible contamination, cuts, or tears before starting to remove. If any PPE is potentially contaminated, then disinfect using an MOH-registered disinfectant wipe.		
2. Disinfect Outer Gloves: Disinfect outer-gloved hands with either MOH registered disinfectant wipe or ABHR, and allow to dry.		
3. Remove Apron (if used): Remove (e.g., by breaking or untying neck strap and releasing waist ties) and roll the apron away from you, containing the soiled outer surface as you roll; discard apron taking care to avoid contaminating gloves or other surfaces.		

4. Inspect: Following apron removal, inspect the PPE ensemble to assess for visible contamination or cuts or tears. If visibly contaminated, then clean and disinfect affected PPE using an MOH-registered disinfectant wipe		
5. Disinfect and remove Outer Gloves: Disinfect outer-gloved hands with either MOH registered disinfectant wipe or ABHR. Remove and discard outer gloves, taking care not to contaminate inner glove during removal.		
9. Inspect and Disinfect Inner Gloves: Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears. If an inner glove is visibly soiled, then disinfect the glove with either a ministry of health registered disinfectant wipe or ABHR, remove the inner gloves, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. If no visible contamination is identified on the inner gloves, then disinfect the inner-gloves with either a ministry of health registered disinfectant wipe or ABHR. If a cut or tear is detected on an inner glove, immediately review occupational exposure risk per hospital protocol.		
10. Remove Respirator (PAPR) with External Belt-Mounted Blower: Remove the headpiece. The healthcare worker may need help removing the headpiece while still connected to the belt-mounted blower and filter unit. (Note: If a PAPR with a self-contained blower in the helmet is used, wait until step 13 to remove components.) a. Remove the belt-mounted blower unit and place all reusable PAPR components in an area or container designated for the collection of PAPR components for disinfection. b. Disinfect inner gloves with either a MOH registered disinfectant wipe or ABHR.		
11. Remove Gown or Coverall: Remove and discard. a. Depending on gown design and location of fasteners, the healthcare worker can either untie fasteners, receive assistance by the trained observer to unfasten the gown, or gently break fasteners. Avoid contact of scrubs with outer surface of gown during removal. Pull gown away from body, rolling inside out and touching only the inside of the gown. b. To remove coverall, tilt head back and reach under the PAPR hood to reach zipper or fasteners. Use a mirror to help avoid touching the skin. Unzip or unfasten coverall completely before rolling down and turning inside out. Avoid contact of scrubs with outer surface of coverall during removal, touching only the inside of the coverall		
9. Disinfect Inner Gloves: Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR		
10. Remove Boot Covers: Sitting on new clean surface(e.g.,second chair or clean side of bench), pull off boot covers taking care not to contaminate pants legs.		
11. Disinfect Washable Shoes: Sitting on a new clean surface (e.g., second clean chair, clean side of a bench) use MOH-registered disinfectant wipe to wipe down every external surface of the washable shoes		
12. Disinfect Inner Gloves: Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR.		

<p>13 . Remove Respirator (if not already removed): If a PAPR with a self-contained filter and blower unit that is integrated inside helmet is used, then remove all components.</p> <ul style="list-style-type: none"> a. Remove and discard disposable hood b. Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR c. Remove helmet, the belt and battery unit. HCW may need help removing the PAPR. d. Place all reusable PAPR components in an area or container designated to collect PAPR components for disinfection. 		
<p>14. Disinfect and Remove Inner Gloves: Disinfect inner-gloved hands with either MOH registered disinfectant wipe or ABHR. Remove and discard gloves taking care not to contaminate bare hands during removal process.</p>		
<p>15. Perform Hand Hygiene: Perform hand hygiene with ABHR.</p>		
<p>16. Inspect: Both the trained observer and the healthcare worker perform a final inspection of the healthcare worker for contamination of surgical scrubs or disposable garments. If contamination is identified, the garments should be carefully removed and the wearer should shower immediately. The trained observer should immediately inform the infection preventionist or occupational safety and health coordinator or their designee for appropriate occupational health follow-up.</p>		
<p>17. Scrubs: HCW can leave the PPE removal area wearing dedicated washable footwear and surgical scrubs or disposable garments, proceeding directly to showering area where these are removed.</p>		
<p>18. Protocol Evaluation/Medical Assessment: Either the infection preventionist or occupational safety and health coordinator or their designee should meet with each healthcare worker on a regular basis to review the patient care activities performed, identify any concerns about care protocols and record the HCW's level of fatigue.</p>		

Name of The observer:

Signature:

B2. Doffing PPE, N95 Respirator Option

Hospital:..... **Location:**.....
Date: **Time:**
Name of HCW:

Preparing for Doffing

- The doffing area should be separated into areas where early and later steps of doffing are conducted (e.g., separate chairs or ends of a bench).
- Before entering the PPE removal area, look for, clean, and disinfect (using approved disinfectant wipe) visible contamination on the PPE.
- As a final step before doffing, disinfect outer-gloved hands with either approved disinfectant or ABHR, and allow to dry.
- Verify that the trained observer is available in the PPE removal area before entering and beginning the removal process.
- If using N95 respirator, a designated assistant might not needed to help with doffing.
- An assistant who is only assisting in doffing should wear the same PPE as the trained observer.
- If the doffing assistant is entering the patient’s room (e.g. as a clinician), the assistant should wear the same PPE as other personnel entering the patient’s room.
- The observer should not touch the person who is doffing and should not serve as the doffing assistant or “buddy.”
- A mirror in the room can be useful for the healthcare worker while doffing PPE.
- PPE should be doffed in the designated PPE removal area. Place all PPE waste in a leak-proof infectious waste container.

For the Trained Observer

- The doffing process is conducted under your supervision
- The doffing process should be supervised by the trained observer, who reads aloud each step of the procedure and confirms visually that the PPE is removed properly. Before the healthcare worker doffs PPE, the trained observer should coach and remind the healthcare worker to avoid reflexive actions that may put them at risk, such as touching their face.
- Post this instruction and repeat it verbally during doffing.

Step	Performance	
	Yes	No
1. Inspect: Inspect the PPE to assess for visible contamination, cuts, or tears before starting to remove. If any PPE is visibly contaminated, then disinfect using an MOH-registered disinfectant wipe.		
2. Disinfect Outer Gloves: Disinfect outer-gloved hands with either MOH registered disinfectant wipe or ABHR.		

<p>3. Remove Apron (if used): Remove (e.g., by breaking or untying neck strap and releasing waist ties) and roll the apron away from you, containing the soiled outer surface as you roll; discard apron taking care to avoid contaminating gloves or other surfaces</p>		
<p>4. Inspect: Following apron removal, inspect the PPE ensemble to assess for visible contamination or cuts or tears. If visibly contaminated, then clean and disinfect affected PPE using MOH-registered disinfectant wipe.</p>		
<p>5. Disinfect and remove Outer Gloves: Disinfect outer-gloved hands with either MOH registered disinfectant wipe or ABHR. Remove and discard outer gloves taking care not to contaminate inner gloves during removal process</p>		
<p>6. Inspect and Disinfect Inner Gloves: Inspect the inner gloves' outer surfaces for visible contamination, cuts, or tears. If an inner glove is visibly soiled, then disinfect the glove with either a ministry of health registered disinfectant wipe or ABHR, remove the inner gloves, perform hand hygiene with ABHR on bare hands, and don a new pair of gloves. If no visible contamination is identified on the inner gloves, then disinfect the inner-gloves with either a ministry of health registered disinfectant wipe or ABHR. If a cut or tear is detected on an inner glove, immediately review occupational exposure risk per hospital protocol.</p>		
<p>7. Remove Face Shield: Remove the full face shield by tilting the head slightly forward, grabbing the rear strap and pulling it over the head, gently allowing the face shield to fall forward and discard. Care must be taken not to touch the face when removing the face shield. Avoid touching the front surface of the face shield.</p>		
<p>8. Disinfect Inner Gloves: Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR.</p>		
<p>9. Remove Surgical Hood: Unfasten (if applicable) surgical hood, gently remove, and discard. The doffing assistant or "buddy" can assist with unfastening hood.</p>		
<p>10. Disinfect Inner Gloves: Disinfect inner gloves with or either MOH registered disinfectant wipe or ABHR</p>		
<p>11. Remove Gown or Coverall: Remove and discard.</p> <ul style="list-style-type: none"> a. Depending on gown design and location of fasteners, the healthcare worker can untie fasteners, have the doffing assistant or "buddy" unfasten the gown, or gently break fasteners. Avoid contact of scrubs or disposable garments with outer surface of gown during removal. Pull gown away from body, rolling inside out and touching only the inside of the gown. b. To remove coverall, tilt head back to reach zipper or fasteners. Unzip or unfasten coverall completely before rolling down and turning inside out. Avoid contact of scrubs with outer surface of coverall during removal, touching only the inside of the coverall. 		

12. Disinfect Inner Gloves: Disinfect inner gloves with either a MOH registered wipes or ABHR.		
13. Remove Boot Covers: Sitting on a clean surface (e.g., second clean chair or clean side of a bench) pull off boot covers, taking care not to contaminate scrubs pants legs.		
14. Disinfect and Change Inner Gloves: Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR. Remove and discard gloves taking care not to contaminate bare hands during removal process. Perform hand hygiene with ABHR. Don a new pair of inner gloves		
15. Remove N95 Respirator: Remove the N95 respirator by tilting the head slightly forward, grasping first the bottom tie or elastic strap, then the top tie or elastic strap, and remove without touching the front of the N95 respirator. Discard N95 respirator		
16. Disinfect Inner Gloves: Disinfect inner gloves with either MOH registered disinfectant wipe or ABHR		
17. Disinfect Washable Shoes: use MOH-registered disinfectant wipe to wipe down every external surface of the washable shoes.		
18. Disinfect and Remove Inner Gloves: Disinfect inner-gloved hands with either MOH registered disinfectant wipe or ABHR. Remove and discard gloves taking care not to contaminate bare hands during removal process.		
19. Perform Hand Hygiene: Perform hand hygiene with ABHR.		
20. Inspect: Both the trained observer and the healthcare worker perform a final inspection of healthcare worker for contamination of the surgical scrubs or disposable garments. If contamination is identified, the garments should be carefully removed and the wearer should shower immediately. The trained observer should immediately inform infection preventionist or occupational safety and health coordinator or their designee.		
21. Scrubs: Healthcare worker can leave PPE removal area wearing dedicated washable footwear and surgical scrubs or disposable garments, proceeding directly to showering area where these are removed.		
22. Protocol Evaluation/Medical Assessment: Either the infection preventionist or occupational safety and health coordinator or their designee should meet with each healthcare worker on a regular basis to review the patient care activities performed, identify any concerns about care protocols and record the healthcare worker's level of fatigue.		

Name of The observer:

Signature:

Appendix (3): Recommendations for Emergency Medical Services (EMS) and Medical First Responders, Including Firefighters and Law Enforcement for Management of Patients Under Investigation (PUIs) for Ebola Virus Disease (EVD)

Patient assessment

- To minimize potential exposure, only one EMS provider should approach the patient and perform the initial screening from at least 3 feet away from the patient. Based on the initial screening, if the EMS provider suspects the patient could have EVD, then PPE should be put on before coming into close contact with the patient. Keep other emergency responders further away, while assuring they are still able to support the provider with primary assessment duties.
- No one should have direct contact with patient who may have EVD without wearing appropriate PPE.
- During patient assessment and management, EMS personnel should consider the signs, symptoms, and risk factors of EVD. A relevant exposure history should be taken including:
 - Residence in, or travel to, a country or area with widespread Ebola virus transmission or cases in urban settings with uncertain control measures.
 - Contact with blood or body fluids (including but not limited to urine, saliva, vomit, sweat, and diarrhea) of a PUI or patient with confirmed EVD.
- Patients who meet the criteria should be further questioned regarding the presence of signs or symptoms of EVD such as fever, severe headache, muscle pain, weakness, fatigue, diarrhea, vomiting, abdominal pain, diarrhea, and unexplained hemorrhage.

Safety and PPE

- If call takers advise the patient is suspected of having EVD, EMS should put on the PPE appropriate for PUIs before entering the scene. PPE options are described in detail below.
- To minimize potential exposure, only one EMS provider should approach the patient and perform the initial screening from at least 3 feet away from the patient. If, based on the initial screening, the EMS provider suspects the patient might have EVD, then PPE should be put on before coming into close contact with the patient. Keep the other emergency responders further away, while assuring they are still able to support the provider with primary assessment duties.
- No one should have direct contact with patient who may have EVD without wearing appropriate PPE.

Based on the clinical presentation of the patient, there are two PPE options.

- If the patient is **not** exhibiting obvious bleeding, vomiting, or diarrhea and there is no concern for bleeding, vomiting, or diarrhea, EMS personnel should follow the PPE guidance for clinically stable PUIs.
- If the patient is exhibiting obvious bleeding, vomiting, or diarrhea or there is concern for potential bleeding, vomiting, or diarrhea then EMS personnel should wear PPE described in Personal Protective Equipment To Be Used by Healthcare Workers During Management of Clinically Unstable Patients with Ebola Virus Disease, Including Procedures for Putting On (Donning) and Removing (Doffing).
- PPE should be put on before entering a scene with a PUI and continue to be worn until providers no longer are in contact with the patient. PPE should be carefully put on and taken off under the supervision of a trained observer.
- If the patient clinical condition warrants invasive or aerosol-generating procedures (such as intubation, suctioning, active resuscitation), then use PPE designated for the care of unstable patients.

- If blood, body fluids, secretions, or excretions from a PUI come into direct contact with the EMS provider's unprotected skin or mucous membranes, then the EMS provider should immediately stop working. They should wash the affected skin surfaces with a cleansing or antiseptic solution, and mucous membranes (e.g., conjunctiva) should be irrigated with a large amount of water or eyewash solution, as per usual protocols. All waste should be placed in a biohazard bag. EMS providers should report exposure to an occupational health provider, supervisor, or designated infection control officer for immediate care.

Patient management

- No one should have direct contact with a PUI without wearing appropriate PPE.
- Use caution when approaching a PUI. On rare occasions, illness can cause delirium, with erratic behavior, such as flailing or staggering. This type of behavior can place EMS providers at additional risk of exposure.
- Keep the patient separated from others as much as possible.
- Limit the number of providers who care for a PUI. All EMS personnel having direct contact with a PUI must wear PPE.
- Limit the use of needles and other sharps as much as possible and should be handled with extreme care and disposed in puncture-proof, sealed containers specific to the care of this patient. Do not dispose of used needles and sharps in containers that have sharps from other patients in them.
- Consider giving the patient oral medicine to reduce nausea, per medical director protocols and consistent with scope of practice.
- If patient is vomiting, give them a large red biohazard bag to contain any emesis.
- If patient has profuse diarrhea, consider wrapping the patient in an impermeable sheet to reduce contamination of other surfaces.
- Pre-hospital resuscitation procedures such as endotracheal intubation, open suctioning of airways, and cardiopulmonary resuscitation frequently result in a large amount of body fluids, such as saliva and vomit. Performing these procedures in a less controlled environment (for example, a moving vehicle) increases risk of exposure to infectious pathogens for EMS providers. Perform these procedures under safer circumstances (when the vehicle has stopped, upon arrival at the hospital destination) and wear the PPE recommended during aerosol-generating procedures.

Pre-hospital care considerations

Pre-hospital patient care is frequently provided in an uncontrolled environment with unique operational challenges. EMS systems must design their procedures to accommodate operational challenges while still following the principles of PPE guidance.

- It may be as simple as having one provider put on PPE and manage the patient while the other provider does not engage in patient care but serves in the role of trained observer.
- There may be situations where a patient must be carried and multiple providers are required to put on PPE. EMS providers wearing PPE who have cared for the patient must remain in the back of the ambulance and should not serve as the driver.
- EMS agencies may consider sending additional resources to eliminate the need for putting on PPE (field-donning) by additional providers. For example, a dedicated driver for the EMS unit may not need to wear PPE if the patient compartment is isolated from the cab.
- Doffing of PPE must be performed with meticulous care to prevent self-contamination. See appendix (2) and ensure training emphasizes adherence to a standardized protocol.

Additional Considerations

- Prepare and use safe procedures to treat and transport the patient to the hospital.
- The EMS provider driving the ambulance should contact the receiving hospital and follow local or regional protocols to transport the patient to the receiving hospital.
- Remove and keep nonessential equipment away from the patient on the scene and in the ambulance. This will eliminate or minimize contamination.
- Avoid contamination of reusable porous surfaces not designated for single use. Cover the stretcher with an impermeable material.
- Conduct appropriate patient assessment according to established protocols, using minimal equipment.

EMS Transport of Patient to a Healthcare Facility

People who may have an exposure history and signs and symptoms suggestive of EVD should be transported to a healthcare facility prepared to further evaluate and manage the patient as instructed by EMS medical direction and local/regional protocols. These should be consistent with the predefined transportation/destination plan developed by public health officials, hospital, medical and EMS personnel.

- Isolate the ambulance driver from the patient compartment.
- During transport, ensure that a MOH approved disinfectant is available in spray bottles or wipes.

Interfacility transport

EMS personnel involved in the interfacility transfer of PUIs or patients with confirmed EVD should follow donning and doffing procedures as recommended . Provide patient care as needed to minimize the contact with patient and follow infection control guidelines noted below.

Infection control

EMS providers can safely manage a PUI by following the appropriate PPE and:

- Limit activities, especially during transport, -that increase the risk of exposure to infectious material.
- Limit the use of needles and other sharps as much as possible and should be handled with extreme care and disposed in puncture-proof, sealed containers that are specific to the care of the patient. Do not dispose of used needles and sharps in containers that have sharps from other patients.
- Invasive procedures should be limited to those essential for patient management.
- Donning and doffing of PPE must be supervised by a trained observer.

Documentation of patient care

- Documentation of patient care should be done after EMS providers have completed their personal cleaning and decontamination of equipment and vehicle. Any written documentation should match the verbal communication given to the EMS at time of patient handover.
- It should include listing of all public providers involved and level of contact with patient (for example, no contact with patient). This documentation need to be shared with preventive medicine.

Cleaning EMS Transport Vehicles after Transporting a PUI for EVD

- EMS performing cleaning and disinfection where body fluids from a PUI are present (vomit, diarrhea, sweat, urine or blood) should wear PPE. If no body fluids are present then minimal PPE should be:
 - Face shield and surgical face mask

- Impermeable gown
- Two pairs of gloves
- Use a MOH -registered disinfectant with a label claim for a nonenveloped virus.
- There should be the same careful attention to the safety of EMS providers during cleaning and disinfection of transport vehicle as during care of the patient.
- Patient-care surfaces (including stretchers, railings, door handles, medical equipment control panels, and adjacent flooring, walls, and work surfaces), as well as stretcher wheels, brackets, and other areas should be cleaned and disinfected thoroughly after each transport.
- A blood spill or spill of other body fluids or substances (like urine, saliva, vomit, sweat, and diarrhea) should be managed by personnel wearing correct PPE. This includes removing bulk spill matter, cleaning the soiled site, and then disinfecting the site. For large spills, a chemical disinfectant with sufficient potency is needed to overcome the tendency of proteins in blood and other body substances to neutralize the disinfectant's active ingredient. Follow the chemical disinfectant product's labeled instructions and dispose of the potentially contaminated materials used during the cleaning and disinfecting process. See appendix 4 for details
- Contaminated reusable patient care equipment (such as glucometer, blood pressure cuff) should be placed in biohazard bags and labeled for cleaning and disinfection or disposal according to agency policies and manufacturer recommendations. Reusable equipment should be cleaned and disinfected according to manufacturer's instructions by trained personnel wearing correct PPE. Avoid contamination of reusable porous surfaces not designated as single use.
- Use only a mattress and pillow with plastic or other covering that fluids cannot penetrate.
- To reduce exposure among staff to potentially contaminated textiles (cloth products) while laundering, discard used linens and non fluid-impermeable pillows or mattresses as appropriate at the receiving facility.

Any item that is contaminated or suspected of being contaminated with Ebola is a Category A infectious substance and must be packaged and transported e.g. disposable medical equipment; sharps; linens; soiled absorbent pads or dressings, kidney-shaped emesis pans, portable toilets; used PPE and by products of cleaning. EMS should work with receiving hospitals to dispose of waste from PUIs.

Follow-up and/or Reporting Measures by EMS Providers After Caring for a PUI for EVD

- EMS providers should be aware of the follow-up and/or reporting measures they should take after caring for a PUI.
- EMS should develop policies for monitoring and management of EMS providers potentially exposed to Ebola virus.
- EMS should develop sick-leave policies that are flexible, and consistent with local health guidance.
- Ensure all EMS providers, including staff who are not directly employed by the healthcare facility but provide essential daily services, are aware of the sick-leave policies.
- EMS providers with exposure to blood, bodily fluids, secretions, or excretions from a PUI should immediately
 - Stop working and wash the affected skin surfaces with a cleansing or antiseptic solution, and mucous membranes (such as conjunctiva of the eye) should be irrigated with a large amount of water or eyewash solution, as per usual protocols. All wipes should be placed in a biohazard bag.
 - Contact occupational health/preventive medicine officer for immediate assessment and access to postexposure management services.
 - Receive medical evaluation and follow-up care, based upon EMS policy and consultation with local preventive medicine department.

Appendix (4) Cleaning of spills of blood and body fluids in EVD

- *Full PPE should be worn before beginning clean up.*
- *Decontamination and disinfection are done with a MOH approved hospital disinfectant with label claim for non-enveloped viruses (e.g., norovirus, rotavirus, adenovirus, poliovirus) or use 5000 ppm available chlorine for high level disinfection.*

For Small Spills

- Gently place absorbent material or paper towels over the spill. If using a powdered absorbent, allow it to fully absorb and use a paper towel to compress the absorbent to ensure no liquid remains. Then cover areas with paper towels as indicated.
- Cover with appropriate disinfectant (approved hospital disinfectant or 5000 ppm available chlorine). Pour disinfectant slowly to ensure no aerosols are generated.
- Allow disinfectant to soak area for 30 minutes for chlorine and according to manufacturer's instructions for other disinfectants.
- Using tongs remove contaminated sharps (i.e., broken glass) from the spilled material and place in a rigid, puncture and leak proof container, if necessary.
- Carefully place the absorbent material into a biohazard bag. Secondly contain biohazard bag to ensure any leaks are contained.
- Clean spill area again with disinfectant and add materials to biohazard bag.
- Carefully remove PPE and place in a biohazard bag and wash hands

For Large Spills

- Quickly contain spill by creating a circular berm around the perimeter of the spill with an absorbent material.
- Add absorbent material to entire spill area working from the edges to the center.
- Cover absorbent with appropriate disinfectant (MOH approved hospital disinfectant or 5000 ppm available chlorine) Pour disinfectant slowly to ensure no aerosols are generated.
- Allow disinfectant to soak area for 30 minutes for chlorine and according to manufacturer's instructions for other disinfectants.
- Carefully place the absorbent material into a secondarily contained biohazard bag.
- Clean spill area again with disinfectant.
- Carefully remove PPE and place in a biohazard bag and wash hands.

N.B. Any item transported offsite for disposal that is contaminated or suspected of being contaminated with Ebola virus must be packaged and transported in triple packs.

Appendix (5) Recommendations for Safely Performing Acute Hemodialysis in Patients with EVD

These recommendations should be implemented along with the rest of precautions in this policy .

Managing Ebola in hospital settings

- Inpatient care of patients with Ebola should be provided in a hospital with capacity to perform continuous renal replacement therapy (CRRT).
- Efforts to minimize direct blood exposure to HCWs and blood contamination of the environment are of principal importance due to the high concentration of Ebola virus in an infected patient's blood and the large volumes of blood involved in hemodialysis.
- All staff involved in providing dialysis should wear full PPE.

Patient placement Hemodialysis/CRRT should only be performed in the patient's isolation room.

Establishing vascular access for dialysis

- Patients with Ebola may have disseminated intravascular coagulation (DIC) and correction of coagulopathy is not always possible.
- Designate a highly competent individual, trained to follow guidelines for proper personal protective equipment (PPE) procedures, to perform catheter insertion.
- Perform catheter insertion in the isolation room and use strategies to minimize blood exposure during dialysis catheter placement. Follow guidelines for prevention of Intravascular Catheter-Related Infections.
- The subclavian site for catheter insertion should be avoided because of the challenges with direct site compression if bleeding occurs. Selection of the internal jugular vs. femoral vein for catheter insertion may depend on patient characteristics and operator proficiency. Using a chest X-ray to confirm line placement will require availability of portable X-ray equipment within the isolation room. This and other factors should be considered in the planning stage before it becomes necessary.
- Ultrasound guidance should be used (by fully trained individual) to reduce cannulation attempts and mechanical complications, including arterial puncture. If used, the ultrasound machine should be dedicated to the isolation room until it can be terminally cleaned and disinfected.
- Attach closed, needleless connector devices to the catheter hubs to reduce blood exposure during catheter connections and disconnections.

Healthcare personnel movement

- If possible, limit the number and types of HCWs involved in hemodialysis/CRRT procedures. For example, ICU nurses performing CRRT could eliminate need for dialysis unit nursing staff.

Dedicated equipment

- A hemodialysis/CRRT machine should be dedicated for use on the patient and kept in the isolation room until terminal disinfection procedures are undertaken.
- All other dialysis-related supplies, including the dialyzer, should be disposed of after use in accordance with the waste management in this policy.
- Under no circumstances should a used dialyzer be reprocessed or reused.

Effluent disposal

- The Ebola virus should not be able to cross an intact dialyzer membrane. Because a small dialyzer leak might not be apparent, however, dialysis effluent should always be handled with care, and while wearing appropriate PPE, to avoid contact and splashes.
- The effluent should be disposed of in the toilet or other dedicated drain in a manner that prevents splashes, and can be safely drained into the waste water sewer system.

Machine selection and management

- Use a dialysis machine that is familiar to the staff that will perform dialysis.

Machines for CRRT

- Certain CRRT machines have features that make them easier to manage and decontaminate while caring for a patient with Ebola, such as a completely closed system, lack of an internal pathway, and use of disposable dialysate and saline supplies.
- The possibility of blood contamination of internal machine components through pressure monitors is also much less likely with these machines than other hemodialysis machines.
- During CRRT, staff should pay close attention to pressure alarms and failures of pressure monitors, and look for and document any failure of the tubing or spillage of fluid outside of the tubing, as these may have implications for more extensive machine disinfection procedures.

Additional considerations

- If clinically appropriate, consider regional citrate anticoagulation during CRRT to reduce episodes of filter clotting that require manipulation of the dialyzer and/or circuit. Regional citrate anticoagulation for CRRT should be used only if the hospital has a protocol in place and nurses who are trained in the protocol.
- Consider using the same CRRT machine for hemodialysis of the patient for as long as possible (while renal replacement therapy is needed) to avoid introducing a second dialysis machine.

Machines for intermittent hemodialysis

- Complete all priming of the circuit prior to connecting bloodlines to the patient's catheter.
- Use disposable accessory supplies, such as priming bucket and concentrate containers, if possible.
 - Establish steps for handling accessory supplies that are not disposable, must be dedicated to the patient, and disinfected between uses.
 - If an attached computer keyboard is needed, use a flat solid surface keyboard that can be easily disinfected or a keyboard cover that can be disinfected or disposed of.
- Pay close attention to pressure alarms, failures of the pressure monitor, and look for and document any flow of blood in the line approaching the external transducer protector, as these may signal internal contamination of the machine with blood.

Machine decontamination/terminal disinfection

External machine surfaces

Cleaning and disinfection of external machine surfaces should be performed in accordance with the infection control policy and manufacturer's instructions. General principles include the following:

- Use appropriate PPE
- Perform a cleaning step using a detergent then, disinfection using MOH approved hospital disinfectant.
- Ensure all surfaces are cleaned and disinfected (including accessory equipment such as IV poles), paying particular attention to high-touch surfaces, such as control panels
- Assure sufficient wet contact time of disinfectant according to label claims for inactivation of a non-enveloped virus

Additional considerations:

- Vaporized hydrogen peroxide and ultraviolet (UV) light applications for decontamination of isolation room surfaces (during terminal disinfection) might serve to disinfect external surfaces of dialysis machines. If UV light is used, the importance of a direct line of sight for efficient disinfection should be considered.

Internal pathways

- Standard heat or chemical disinfection procedures recommended by machine manufacturers and used routinely by dialysis providers are sufficient to inactivate Ebola virus.
- Internal machine disinfection of machines should be performed between treatments in the isolation room.

Other internal machine components

- If there is concern about the possibility of fluid contamination of internal machine components such as pressure monitors, contact the manufacturer for guidance and notify the Infection Control Department.

Appendix (6) Step-by-step Guidelines for Postmortem Preparation in 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 disinfectant wipe.
8. Disinfect outside of first bag with an 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 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 hospital disinfectant.
 - Begin by applying the hospital disinfectant to top of bag and exposed areas of gurney 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 disinfectant wipe, reapply an approved hospital disinfectant and allow sufficient contact time, as specified by manufacturer.
18. Disinfect surfaces of gurney from handles to wheels with an approved 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.

At this point, the body bag has been decontaminated, workers who handle the body bag from this point until the body is placed into a metal casket should wear single-use (disposable) gloves with extended cuffs and a long-sleeved disposable gown; other PPE is optional. If there is no evidence that the body bag has been compromised by a tear or liquid coming from the bag, surfaces that contact the body bag should not be considered contaminated, and gloves and disposable gowns used for transport can be disposed of as regular trash.