

Guidelines for hospital infection control while managing the suspect/ case of Ebola Disease

1. Direct Patient Care (Suspect/case of Ebola Disease)

1.1 Patient Placement

- Place the patient in single room (containing a private bathroom) with the door closed.
- Absolutely Restrict all non-essential staff from patient care areas.
- Maintain a log of persons entering the patient's room
- Allow access to only those necessary for the patient's well-being and care, such as a child's parent, if absolutely necessary.
- Use of Personal Protective Equipment (PPE) is essential for the health care worker/caregiver
- All persons entering the patient room should be well trained and equipped for donning and doffing of PPE and must wear at least:
 - Gloves
 - Gown (fluid resistant or impermeable) to cover clothing and exposed skin
 - Eye protection (goggles) to prevent splashes on eye.
 - Facemask to prevent splashes on nose and mouth.
 - Face shield, if used, will protect eye, nose and mouth.
 - Closed impermeable shoes
- Additional PPE might be required in certain situations (e.g., copious amounts of blood, other body fluids, vomit, or faeces present in the environment), including but not limited to:
 - Double gloving
 - Disposable shoe covers
 - Leg coverings

Perform hand washing before and after direct patient care, after any contact with potentially contaminated surfaces, and after removal of PPE. Perform hand hygiene before and after direct patient care, after any contact with potentially contaminated surfaces, and after removal of PPE. Neglecting to perform hand hygiene after removing PPE will reduce or negate any benefits of the protective equipment.

- Before exiting the isolation area of a patient with suspected Ebola disease, carefully remove and dispose of protective equipment.
- When removing PPE, be careful to avoid any contact between the soiled items (e.g. gloves, gowns) and any area of the face (i.e. eyes, nose or mouth).
- Limit the use of needles and other sharp objects as much as possible.
- Limit the use of phlebotomy and laboratory testing to the minimum necessary for essential diagnostic evaluation and patient care.

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

2. Laboratory Activities

- Activities such as micro-pipetting and centrifugation can mechanically generate fine aerosols that might pose a risk of transmission of infection through inhalation.
- Laboratory personnel handling potential Ebola disease clinical specimens should wear gown, gloves, particulate respirators (e.g. N95) and eye protection or face shields, or powered air purifying respirators (PAPR) when aliquotting, performing centrifugation or undertaking any other procedure that may generate aerosols.
- When removing protective equipment, avoid any contact between the soiled items (e.g. gloves, gowns) and any area of the face (i.e. eyes, nose or mouth).

Perform hand hygiene immediately after the removal of protective equipment used during specimen handling and after any contact with potentially contaminated surfaces.

- Place specimens in clearly-labeled- Name, Hosp ID, Date of collection and bold labelling of **“Suspect Ebola”** on all vials in non-glass, leak-proof containers and deliver directly to designated specimen handling areas.
 - Disinfect all external surfaces of specimen containers thoroughly (using an effective disinfectant) prior to transport. E.g. Sodium hypochlorite at 1%, 500 ppm available chlorine (i.e. 1:100 dilution of household bleach at initial concentration of 5%) or 5% Lysol.
 - In the laboratory, pre-identify and train the lab personnel’s who would perform the tests.
 - Equipment (cell counters, analyzers etc.) should also be disinfected appropriately as per manufactures instructions

3. Non Patient Care Activities

- Contact tracing and case finding interviews should be conducted outdoors whenever possible and a distance of more than one meter should be maintained between interviewer and interviewee.
- Protective equipment is not required when interviewing asymptomatic individuals.

4. Environmental Infection Control

- Environmental surfaces or objects contaminated with blood, other body fluids, secretions or excretions should be cleaned and disinfected using standard hospital detergents/disinfectants eg. Freshly prepared 1% Sodium Hypochlorite or 5% Lysol
- Do not spray (i.e. fog) occupied or unoccupied clinical areas with disinfectant. This is a potentially dangerous practice that has no proven disease control benefit.
- Wear gloves, gown, mask and closed impermeable shoes (e.g. boots) when cleaning the environment and handling infectious waste. Cleaning heavily soiled surfaces (e.g. soiled with vomit or blood) increases the risk of splashes. On these occasions, facial protection should be worn in addition to gloves, gown and closed, impermeable shoes.
- Soiled linen should be placed in clearly-labelled, leak-proof bags or buckets at the site of use and the container surfaces should be disinfected (using an effective disinfectant) before removal from the site. Linen should be transported directly to the laundry area and laundered promptly with water and detergent. For low-temperature laundering, wash linen with detergent and water, rinse and then soak in 1% chlorine for approximately 30 minutes. Linen should then be dried according to routine standards and procedures.

Linen that has been used by Ebola disease patients can be heavily contaminated with body fluids (e.g. blood, vomit) and splashes may result during handling. When handling soiled linen from Ebola disease patients, use gloves, gown, closed impermeable shoes and facial protection.

- If safe cleaning and disinfection of heavily soiled linen is not possible or reliable, it may be prudent to burn the linen to avoid any unnecessary risks to individuals handling these items.

5. Waste Management

- Waste should be segregated to enable appropriate and safe handling.
- Sharp objects (e.g. needles, syringes, glass articles) and tubing that has been in contact with the bloodstream should be placed inside puncture resistant containers. These should be located as close as practical to the area in which the items are used.
- Collect all solid, non-sharp, medical waste using leak-proof waste bags and covered bins.
- Waste should be placed in a designated pit of appropriate depth (e.g. 2 m deep and filled to a depth of 1–1.5 m). After each waste load the waste should be covered with a layer of soil 10–15 cm deep.
- An incinerator may be used to destroy solid waste. However, it is essential to ensure that total incineration has taken place. Caution is also required when handling flammable material and when wearing gloves due to the risk of burn injuries if gloves are ignited.
- Placenta and anatomical samples should be buried in a separate pit or incinerated.

- The area designated for the final treatment and disposal of waste should have controlled access to prevent entry by animals, untrained personnel or children.
- Wear gloves, mask, gown and closed impermeable shoes (e.g. boots) when handling solid infectious waste.
- Waste, such as faeces, urine and vomit, and liquid waste from washing, can be disposed of in the sanitary sewer or pit latrine. No further treatment is necessary.
- Wear gloves, gown, mask, closed shoes and goggles/facial protection, when handling liquid infectious waste (e.g. any secretion or excretion with visible blood even if it originated from a normally sterile body cavity). Avoid splashing when disposing of liquid infectious waste.

6. Handling of dead body

Deceased individuals should be correctly identified and handled with dignity. Only trained personnel should handle remains during an outbreak. Any handling of human remains should be kept to a minimum (e.g. only for post-mortem specimen collection, transport or burial of the body). Post-mortem examination of patient remains should be limited to essential evaluations only and should be performed by a trained person; alternatives to post-mortem examinations (e.g. needle biopsies) should be considered.

- The handling of human remains should be kept to a minimum.
- Remains should not be sprayed, washed or embalmed.
- Personnel performing autopsies of known or suspected HF patients should wear a particulate respirator (e.g., FFP2, or EN certified equivalent, or US NIOSH-certified N95) or a PAPR.
- When removing PPE, avoid any contact between soiled gloves or equipment and the face (i.e. eyes, nose or mouth).
- Hand hygiene should be performed immediately following the removal of PPE.
- Place specimens in clearly-labelled, non-glass, leak-proof containers and deliver directly to designated specimen handling areas.
- All external surfaces of specimen containers should be thoroughly disinfected (using an effective disinfectant) prior to transport.
- Tissue or body fluids for disposal should be carefully placed in clearly marked, sealed containers for incineration.
- Cleaners/hygienists and mortuary/burial workers should wear the same PPE recommended for other health and care workers, with the exception that 1) the outer pair of gloves should be

heavy-duty (utility) gloves, 2) aprons should be heavy-duty, and 3) their footwear should be waterproof boots.

- Personal Protective equipment is not required for individuals driving or riding a vehicle to collect human remains.
- Personal Protective equipment should be donned at the site of collection of human remains and worn during the process of collection of human remains and while placement in a body bag.
- Personal Protective equipment should be removed immediately after remains have been placed in a body bag.
- Remains should be wrapped in sealed, leak-proof material and should be cremated/buried promptly.
- The body will be placed into an appropriate body bag. It should be:
 - o Impermeable, vinyl, minimum thickness 400 microns
 - o Able to hold 100-125 kilos
 - o Equipped with at least four handles to allow safe hand carry
 - o Leak-proof and able to fully contain blood-borne pathogens

7. Managing Exposure to infection

- Persons including health care workers (HCWs) with percutaneous or muco-cutaneous exposure to blood, body fluids, secretions, or excretions from a patient with suspected Ebola case should immediately wash the affected skin surfaces with soap and water. Mucous membranes (e.g. conjunctiva) should be irrigated with copious amounts of water or eyewash solution.
- Exposed persons should be medically evaluated and receive follow-up care, including fever monitoring, twice daily for 21 days after exposure. Immediate consultation with an expert in infectious diseases is recommended for any exposed person who develops fever within 21 days of exposure.
- HCWs suspected of being infected should be isolated, and the same recommendations outlined in this document must be applied until a negative diagnosis is confirmed
- Contact tracing and follow-up of family, friends, co-workers and other patients, who may have been exposed to an Ebola virus through close contact with the infected HCW is essential.

8. Guidelines for health care providers

Health care workers who handle the suspected/ confirmed patients without observing recommended universal precautions are at high risk of acquiring the infection. Therefore, health workers while taking care of these patients should observe the following:

In addition to standard universal precautions, health workers should strictly apply recommended infection control measures to avoid exposure to infected blood, fluids, or contaminated environments or objects – such as a patient’s soiled linen or used needles.

- They should use personal protection equipment such as individual gowns (impermeable), gloves, masks and goggles or face shields and closed impermeable shoes with shoe cover.
- They should use disposable personal protective equipment or clothing unless they have been properly disinfected with 1% bleach or phenolic products.
- They should change gloves between caring for each patient suspected of having Ebola and strictly follow hospital waste management guidelines.
- Invasive procedures that can expose medical doctors, nurses and others to infection should be carried out under strict, safe conditions. For aerosol generating procedures PPE should include respiratory protection N95 masks or higher and the procedure should be performed in airborne isolation room.
- Dedicated medical equipment should be used (preferably disposable whenever possible)
- All non-dedicated, non-disposable medical equipment used for patient care should be cleaned and disinfected as per manufacturer’s instructions and hospital policies
- Use of injections and sharps should be limited and laboratory testing to the minimum necessary for essential diagnostic evaluation and patient care.
- If the use of sharp objects cannot be avoided, ensure that the following precautions are observed:
 - Never replace the cap on a used needle.
 - Never direct the point of a used needle towards any part of the body.
 - Do not remove used needles from disposable syringes by hand, and do not bend, break or otherwise manipulate used needles by hand.
 - Never re-use syringes or needles.
 - Dispose of syringes, needles, scalpel blades and other sharp objects in appropriate, puncture-resistant containers.
 - Ensure that containers for sharps objects are placed as close as possible to the immediate area where the objects are being used (‘point of use’) to limit the distance between use and disposal, and ensure the containers remain upright at all times.
 - Ensure that the containers are securely sealed with a lid and replaced when $\frac{3}{4}$ full.
 - Ensure the containers are placed in an area that is not easily accessible by visitors, particularly children (e.g. containers should not be placed on floors, or on the lower shelves of trolleys in areas where children might gain access).
 - Closed, resistant shoes (e.g. boots) should be used by all individuals in the patient care area to avoid accidents with misplaced, contaminated sharp objects.

Prevention of Ebola Disease Transmission in Hospitals

| Component | Recommendation | Comments |
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| Patient Placement | <ul style="list-style-type: none"> • Single patient room (containing a private bathroom) with the door closed. • To maintain a log of all persons entering the patient's room | To ensure appropriate and consistent use of PPE by all persons entering the patient room |
| Personal Protective Equipment (PPE) | <ul style="list-style-type: none"> • All persons entering the patient room should wear at least: <ul style="list-style-type: none"> o Gloves, Gown (fluid resistant or impermeable) to cover clothing and exposed skin o Eye protection (goggles) to prevent splashes on eye. o Facemask (N95 mask or medical mask) to prevent splashes on nose and mouth. o Face shield, if used, will protect eye, nose and mouth. o Closed impermeable shoes <p>Additional PPE might be required in certain situations (e.g., copious amounts of blood, other body fluids, vomit, or feces present in the environment), including but not limited to:</p> <ul style="list-style-type: none"> o Double gloving o Disposable shoe covers o Leg coverings | <ul style="list-style-type: none"> o PPE should be worn by all Health Care Provider upon entry into patient rooms or care areas. Ensure that PPE should be carefully removed & discarded as per hospital waste management guidelines. o The person handling waste should wear full PPE. o Hand hygiene should be performed before donning PPE & immediately after removal of PPE |
| Patient Care Equipment | <ul style="list-style-type: none"> • Dedicated medical equipment (preferably disposable) 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 | <ul style="list-style-type: none"> • The equipment should be as far as possible dedicated to isolation rooms. |

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| <p>Patient Care Considerations</p> | <ul style="list-style-type: none"> • Limit the use of needles and other sharp objects as much as possible. • Limit the use of phlebotomy and laboratory testing to the minimum necessary for essential diagnostic evaluation and patient care. • If the use of sharp objects cannot be avoided, ensure to follow safe injection practices. | <ul style="list-style-type: none"> • All needles and sharps should be handled with extreme care and disposed in puncture-proof, sealed containers & follow as per hospitals guidelines for disposal. |
| <p>Aerosol Generating Procedures on patients</p> | <ul style="list-style-type: none"> • To be avoided as far as possible. • If unavoidable follow a procedure to minimize exposures from aerosol-generating procedures when performed on Ebola HF patients. • Visitors /relatives should not be present. • Limit the number of health care providers present during the procedure for the activity. • Conduct the procedures in an isolation room as far as possible. • 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. • HCP should wear complete PPE with N95 masks during the procedure. • Disinfect the room after the procedure is over. • If re-usable equipment is used, they should be cleaned and disinfected according to manufacturer instructions and hospital policies. • Collection and handling of soiled re-usable respirators must be done by trained individuals using PPE as described above for routine patient care | <ul style="list-style-type: none"> • Because of the potential risk to individuals reprocessing reusable respirators, disposable filtering face piece respirators & equipment should be preferred. • Define a list of procedures like intubation, etc. |

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| Hand Hygiene | <ul style="list-style-type: none"> To perform hand hygiene frequently, including before and after all patient contact, contact with potentially infectious material, and before putting on and upon removal of PPE, including gloves. Ensure that supplies for performing hand hygiene like hand rub or soap & water are freely available. | <p>Hand hygiene in healthcare settings can be performed by washing with soap and water or using alcohol based hand rubs.</p> <p>If hands are visibly soiled, use soap and water, not alcohol based hand rubs.</p> |
| Environmental Infection Control | <ul style="list-style-type: none"> Environmental cleaning and disinfection and safe handling of potentially contaminated materials is paramount, as blood, sweat, emesis, faeces and other body secretions represent potentially infectious materials Health care providers performing environmental cleaning and disinfection should carry out all activities after wearing complete set of PPE & follow hospital infection control guidelines strictly. | Ebola virus is susceptible to all commonly used disinfectants e.g sodium hypochlorite (1%) |
| Safe Injection practices | <ul style="list-style-type: none"> 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 disposable syringes & needles are only to be used | Follow safe injection practices. |
| Duration of Infection Control Precautions | <ul style="list-style-type: none"> Till the patient is in hospital & as the patient is infectious even after he /she is asymptomatic hence even at home safety precautions to be followed till two months from the date of onset of the symptoms appeared | It will help in containment. |
| Self-health monitoring | <ul style="list-style-type: none"> Recommended for all health care providers and visitors & contacts. For a period of 21 days of last exposure. | Prevent spread of disease & containment there off. |