

**Ebola Virus Disease (EVD) Infection Prevention and Control
Standard Operating Procedures (SOP)
For Health Clinics, Health Centers and Hospitals
“Keep Safe - Keep Serving”**



Liberia: Updated December 16, 2014 (previous version: September 25, 2014)

This document is intended to inform infection prevention and control (IPC) practices and supply needs in healthcare facilities during the EVD outbreak. As the outbreak evolves, the document will need to be adapted accordingly. When the outbreak is over, the additional precautions for Ebola will be discontinued; standard precautions (Annex 3) will be implemented.

Rationale for the update:

- Adapt recommendations to accommodate varying availability of different types of PPE
- Comply with the *WHO Rapid Advice Guideline on IPC in the Context of Filovirus Disease Outbreak Response* [<http://www.who.int/csr/resources/publications/ebola/ppe-guideline/en/>] issued in October 2014.

Summary of changes in this revision as compared to version issued on September 25:

- Focus on the most essential measures according to the setting.
- Emphasize the importance of hand hygiene as the main measure to break the chain of transmission.
- Emphasize the importance of a “no touch” / “minimal touch” policy and maintaining a distance of 1-2 meters (3-6 feet) between persons.
- Emphasize the need for triage for all persons in the facility, including workers, and for triage being an on-going process.
- Revise Annex 2 (PPE use), in accordance with PPE guidance above.
- Revise order of PPE removal to maximize protection of mucosa of eyes, nose, and mouth (to remove eye protection and mask as the final step of doffing).
- Emphasize the absolute necessity of having someone else observe when putting on and removing enhanced PPE (using a “buddy system”).
- Include guidance for alternative PPE options, such as coveralls as an alternative to gowns for enhanced PPE.
- Increase clarity of text.
- Revise Annex 3 to describe standard precautions.
- Include IPC guidance for hospital laboratory staff.



1. General Considerations:

- Healthcare workers (HCWs) should *not* come to work when they are sick.
- Health facility staff should not touch other facility staff when they are at work, and should remain 3-6 feet away from other staff at all times.
- All health facility staff should undergo triage upon presentation to work, with temperature measurement. If temperature $>38.0^{\circ}\text{C}$, staff should NOT be allowed to work and should seek medical care at a health center or hospital.
- All staff should wear closed-toed shoes to work.
- Staff working labor and delivery areas, or wards/areas with patients who stay overnight should change out of their street clothes and shoes on arrival at the health facility and put on scrubs or dedicated hospital clothing and boots or closed-toed shoes. Staff should change back into street clothes before leaving the facility.
- A senior staff member must be designated as the Infection Prevention and Control (IPC) Officer for the facility. This person is accountable for ensuring that practice at the facility meets MOHSW IPC standards, that all staff members have adequate training and adhere to IPC policies, and that supplies for IPC are adequate.
- Health centers and hospitals must have a staff member or team of staff members who report to the IPC Officer and who are responsible for monitoring IPC practice, assessing adequacy of IPC supply levels, conducting staff IPC training, and reporting the results to the IPC officer and county health team IPC focal point. In hospitals with >100 beds, a full time position dedicated to IPC is highly recommended.
- **Hand hygiene is the most important single measure to interrupt transmission of infections, including EVD.**
- “No touch / minimal touch” – that is, keeping a distance of 1-2 meters (3-6 feet) and minimizing direct contact – is a simple, but very effective way to interrupt transmission of EVD. Distance should be maintained and minimal touch should be employed even when PPE are worn, because contaminated equipment and gloved hands can touch the face either during care or during doffing.
- **There should be strict adherence to standard precautions (Annex 3) for all patient care.**
- There are 2 levels of PPE:
 - Basic: Minimum level of PPE for everyone with who may touch a patient or the immediate environment of a patient, or who handles laboratory specimens.
 - Enhanced: PPE for those involved in DIRECT patient care of patients with suspect, probable or confirmed Ebola, those entering isolation areas where patients with suspect, probable or confirmed Ebola are or have been present prior to decontamination, staff working in delivery areas or with patients with significant vaginal bleeding, staff handling dead bodies and staff who are cleaning up body fluid spills.
- All health clinics, centers and hospitals must be able to effectively triage staff, patients and visitors to identify suspect and probable cases of EVD, and to safely hold/manage such patients until they can be transferred to a CCC or ETU for assessment.
- All facilities should have a designated isolation space for suspected/probable Ebola patients who are awaiting transfer. Whether location (indoors v outdoors) and size of this space depends on the size of the facility, and its proximity to ETUs/CCCs (see section 3. *Isolation area*).



- All clinics should work with their district/county health teams to ensure that a process is in place to assess and manage persons who are identified at triage as suspect or probable Ebola cases, and to ensure that patients receive not only assessment for Ebola, but also treatment of other illnesses if they do not have Ebola.

2. Triage

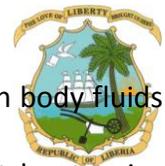
- Establishing Triage:
 - Effective triage and screening is the single most important administrative control and must be established in all healthcare facilities.
 - All patients and staff entering the facility must pass through one common point for triage before entering the facility. This should be made clear with signs, and other entrances should be closed to ensure they are not used. Large clinics may consider having separate entrances and triage for staff and patients; however, it is essential that all entrances have operational triage at all times when they can be used for access.
 - The complete triage process – including temperature screening and asking about case contact and symptoms - should operate at all times when the facility is open.
 - *Every* person (patients, family, and staff [including doctors, management and supervisors]) must go through the triage process before being allowed in to the facility. Triage staff should always be 1-2 meters (3-6 feet) away from persons being screened and should not touch these persons, their belongings, or other items that patients may have touched.
 - Basic PPE should be worn by all staff performing triage. Gloves should be changed and hand hygiene performed whenever the gloves have touched a person, their belongings, or items in the environment that patients have touched. Face shields should be removed (see doffing instructions) when they have been contaminated with body fluids or touched by contaminated gloves.
- Triage process: General
 - Ensure that the person being triaged cleans their hands with 0.05% chlorine or alcohol based hand sanitizer.
 - Assess the patient using the case definition algorithm (Annex 1). To complete triage, you must know the patient's temperature, their history of contact with Ebola cases, and whether or not they have symptoms of EVD. The order in which the information is obtained, exactly how the questions are asked, and whether the information is documented in writing will depend on the facility and the patient population.
 - Hospitals should document admitting and on-going triage information for in-patients in a designated place on the hospital chart
 - **FEVER assessment:**
 - Take the patient's temperature from the side with an extended arm, using an infrared "no touch" thermometer. A digital thermometer may be used to take an axillary temperature if a "no touch" thermometer is not available. For the protection of patients it is essential to disinfect the digital thermometer between each patient with a cloth soaked in 0.05% chlorine.



- Also ask the person (or their guardian/caregiver) if they have had a recent fever (if yes, the person should be considered to have a fever, even if the triage temperature is normal).
- **CONTACT with an Ebola case**
 - For case management, this is defined as one of the types of contact listed in Annex 1 with a suspect, probable or confirmed case of EVD.
 - Facilities may first ask a question about whether the patient may have had contact with an Ebola patient, and then ask further questions if the answer is yes. Alternatively, a facility may wish to start with a question about whether the patient has a household member or other close contact who has been seriously ill or died, or whether they have been at a funeral, and then determine whether the ill person might have had Ebola.
- **SYMPTOMS compatible with Ebola (Annex 1)**
 - In addition to the symptoms listed in Annex 1, patients must be asked about bleeding.
 - Facilities who are screening staff, visitors or out-patients who are likely to be well (eg. coming for vaccination visits or blood pressure screening), may wish to ask first how the patient is feeling, or if the person is feeling well. If the answer to this is “yes”, then further questioning may not be necessary.
 - Patients being admitted to the hospital must be specifically screened for symptoms at admission, and twice daily during their admission.
- For out-patient areas, a first stage of triage at facility entry may be conducted by any adequately trained staff member, who can take temperatures and ask if the person being triaged has had a contact with an EVD case or is feeling unwell, and who can refer person with a fever or a potential contact with EVD or symptoms for completion of triage by a clinician. If non-clinical staff are screening at triage, persons who fail screening should be moved to a designated space in which a clinical staff member can promptly complete triage.
- Patients/staff/visitors not meeting the criteria for suspect or probable EVD can be seen for their out-patient visit or admitted to the facility, as relevant. Note that, for patients who stay overnight, on-going triage - taking temperatures at least 3 times per day – and assessing for symptoms of Ebola at least twice daily– is required.
- If a patient meets the suspect or probable Ebola case definition:
 - Inform the patient
 - Move the patient to the designated isolation space.
 - Doff your basic PPE (see Annex 2)
 - Discuss with a supervising clinic provider to confirm.
 - Report the case to the local health officer or call your Ebola hotline.
- Facilities may wish to choose to conduct triage for EVD and for other transmissible infections simultaneously.
- Triage for maternity patients
 - Maternity patients may pose special problems:
 - Ebola may present with bleeding in pregnancy and should be considered when women present to the healthcare facility with bleeding during pregnancy.



- Women with normal births have a much lower chance of being EVD cases than women presenting with miscarriages or abortions.
 - All staff delivering babies or cleaning rooms/spaces used for delivering babies should wear enhanced PPE for patient care and cleaning.
 - All staff providing direct care for patients with significant vaginal bleeding (e.g. threatened miscarriage) should wear enhanced PPE.
 - Each health facility which routinely manages maternity patients should have a plan for managing those maternity patients with suspect or probable Ebola who cannot be referred to a CCC or ETU. For clinics, this may include referral to an isolation ward at a health center or hospital, but should also include management of the patient at the clinic. Health centers and hospitals must have an isolation area where maternity care can be provided for pregnant women with suspect/probable Ebola. Clinical and housekeeping staff of the maternity ward must be adequately trained in IPC for managing Ebola patients, including the use of enhanced PPE.
 - Health facilities who may have to care for suspect or probable Ebola maternity patients should develop a plan with their county health team for having these patients tested for Ebola promptly.
- Triage for patients who are admitted to the hospital
 - On-going twice daily triage must be conducted among admitted patients on the ward:
 - Take temperatures of all in-patients at least 3 times a day.
 - Twice per day, and whenever a temperature $\geq 38.0^{\circ}\text{C}$ is recorded, assess the patient for symptoms of Ebola: headache, vomiting, nausea, loss of appetite, diarrhea, intense fatigue, abdominal pain, general muscular pain or articular pain, difficulty in swallowing, difficulty in breathing, hiccoughs. Determine if the patient meets the case definition for a suspect case (Annex 1).
 - Document the twice daily assessments; it is recommended that a hospital form be developed for this documentation.
 - Patients who are transferred to hospitals from CCCs or ETUs after having been cleared of Ebola should be managed as contacts of cases of EVD. While in hospital, they should be cared for in enhanced precautions, and followed closely for fever and symptoms. If fever develops, they should be classified as a probable case of Ebola.
 - Follow the process under #5 – *Inpatient wards* for patients who are identified as a suspect or probable case of Ebola.
 - PPE and hygiene practices for the triage staff person:
 - Set up a hand hygiene station at entrance (e.g., alcohol based hand sanitizer or bucket of 0.05% chlorine solution). (see Annex 4 for preparation of chlorine solutions)
 - All triage staff should wear basic PPE (i.e., face shield, gown, gloves) and rubber boots. The triage staff person should follow a ‘no touch’ process when assessing the patient. A distance of at least 1-2 meter (3-6 feet) should be maintained.
 - Basic PPE should be worn by all staff performing triage. Gloves should be changed and hand hygiene performed whenever the gloves have touched a person, their belongings, or items in the environment that patients have touched. Face shields should be



- removed (see doffing instructions) when they have been contaminated with body fluids or touched by contaminated gloves.
- Touched surfaces in the triage area should be cleaned and disinfected at least twice daily, and immediately after any suspect/probable Ebola patient has been identified.
 - Infrared thermometers should be wiped with a cloth soaked in 0.05% chlorine at least twice daily, and immediately after any suspect/probable Ebola patient has been identified.
 - If the triage staff member is exposed to bodily fluids, the following steps should be taken immediately:
 - Do not touch anything.
 - Alert a fellow staff member or “buddy” who will immediately accompany the staff member to the PPE doffing area (to assure proper doffing and to minimize risk of mistakes on way to doffing area) to decontaminate the exposed mucous membrane/skin area and doff PPE.
 - Decontaminate the exposed area:
 - **EYES:** Flush with copious amounts of clean water/ringer lactate or normal saline.
 - **NOSE or MOUTH:** Immediately rinse with 0.05% chlorine solution. Do not swallow chlorine solution; do NOT use 0.5% chlorine. Then rinse and spit several times with copious amounts of clean water.
 - **NEEDLE STICK, CUT, CONTACT WITH BROKEN OR INTACT SKIN:** Immediately immerse the exposed site in 70% alcohol for 30 seconds, or 0.5% chlorine solution for 3 minutes. Then wash area well with soap and water. Rinse with clean running water for 30 seconds. Apply dressing if needed.
 - Doff PPE safely as per Annex 2. Decontamination of the exposed area may take place either prior to or after doffing, depending on the nature of the exposure.
 - Inform the clinic supervisor, who will contact the County health team.

3. Isolation area/Management of patients with suspect/probable Ebola

- Patients who are classified as suspect or probable Ebola cases and cannot be transported immediately from the health facility to an ETU or CCC should be kept in a separate area (isolation area) away from other patients and health care workers.
- In clinics and small health centers:
 - The isolation area may be indoors or outdoors; if out doors, it should be protected from sun and rain
 - The isolation area must be large enough and secure enough that the patient can remain 3 to 6 feet (1-2 meters) from other patients and staff while they are waiting, and that other patients and staff will not touch the patient or their environment.
 - Clinics must be prepared to manage a patient with “wet” symptoms (e.g. vomiting diarrhea, bleeding), who may need a dedicated latrine (or a bucket if a latrine cannot be dedicated to the patient) during the wait.
 - If the patient is sick enough, or is identified after admission to the clinic, it may be necessary to temporarily close the clinic so that safe care can be provided to the patient until s/he can be moved and the clinic decontaminated



- Larger health centers and hospitals must have an indoor isolation area, which can be used to care for patients (including maternity patients) who cannot be immediately transferred to an ETU or CCC.
 - The isolation area should have no more than one entrance and exit, which can be monitored at all times. It should be in a low-traffic area of the building.
 - The isolation area should be close to an exit where an ambulance can park, so that the patient can be evacuated without having to walk through the facility.
 - If possible, the isolation area should be cool, for patient comfort and to permit staff to work in enhanced PPE. If the isolation area has fans or air-conditioners, care should be taken to ensure that either the air flow will not aerosolize spills of body fluids.
 - The isolation area should be clearly signed and demarcated.
 - Staff should only enter the isolation area if it is necessary that they do so.
 - Registers should be kept of all patients and staff who enter the isolation area.
 - Visitors are not permitted in the isolation area.
 - The isolation area should have a designated separate latrine for each patient in isolation. If this is not possible, patients should use buckets for urine and stool.
 - There should be a designated space at the entrance and exit to the isolation area for donning and doffing PPE. These rooms should be cleaned and disinfected at least 3 times/day, by cleaners wearing enhanced PPE.
 - Whenever possible, staff should not work in the isolation area and in other areas of the hospital on the same shift.

- Management of patients with suspected or probable Ebola
 - All staff entering the isolation areas must wear enhanced PPE.
 - Enhanced PPE should be worn by anyone who must touch anything that the patient has touched (e.g., dirty clothes, utensils).
 - Providers should enforce a “no touch” treatment policy. If care must be given, “minimal touch” policies may be used.
 - PPE should be changed immediately if soiling with bodily fluids occurs
 - If more than 1 patient is in the isolation area, PPE should be changed after direct contact with one patient and before contact with the next.
 - Oral fluids, including 4-5 liters/day of ORS, and oral medications should be utilized; no intravenous fluids or medications should be given.
 - Treatment for malaria should be initiated for febrile patients. Other antibiotics should be started empirically as warranted.
 - No rapid diagnostic tests other than EVD tests should be performed. EVD tests should be performed by staff sent from the ETU/CCC/central laboratory testing.
 - If more than 1 patient is in the isolation area, keep all beds at least 1-2 meters (3-6 feet) away from each other.
 - Provide the patient with his or her own plate, cup, and utensils (spoon, fork), toothbrush, etc. No item should be shared with others.
 - Contact between the patient and other patients, relatives and visitors is prohibited.
 - Once the patient has been transferred, a staff member wearing Enhanced PPE must decontaminate the space and latrine using 0.5% chlorine solution, then clean the area



- with soap and water, followed by a second decontamination with 0.5% chlorine (Annex 4).
- A supervisor or second staff member should check that the space is safe to use as soon as the second decontamination process is complete.

4. Outpatient care

- Patients who have completed triage and who are not classified as suspect, probable, or confirmed Ebola cases can be cared for in out-patient areas.
 - Standard precautions must always be followed when caring for patients (see Annex 3)
 - Basic PPE should be worn (Annex 2). In some ambulatory clinics, where the risk of gown contamination with body fluids is very low (e.g. hypertension management), the infection control officer may approve waiving the requirement to wear a water resistant gown over clothes; however, workers should retain the choice to wear such a gown whenever providing any patient care.
 - Gloves **must** be changed and hands hygiene performed between each patient visit.
 - Gowns and face shields should be changed if:
 - They become visibly contaminated with body fluids
 - For face shields, if they are touched by gloves that may be contaminated
 - Whenever the worker is leaving the patient care area for any reason.
 - For the duration of the Ebola outbreak, a 'no touch/minimal touch' policy should still be in place. Intravenous fluids and intravenous or intramuscular injections should be avoided whenever oral alternatives are possible.
 - As noted in Annex 3, safe management of needles is an important component of standard precautions.

5. In-patient wards

- Patients who are not classified as suspect, probable, or confirmed Ebola can be cared for on the general ward. As much as possible, a "minimal touch" policy should still be in place.
- Basic PPE should be worn in the general wards (Annex 2).
 - Gloves **must** be changed and hands hygiene performed between each patient visit.
 - Gowns and face shields should be changed if:
 - They become visibly contaminated with body fluids
 - For face shields, if they are touched by gloves that may be contaminated
 - Whenever the worker is leaving the patient care area for any reason.
- Monitoring for Ebola disease: actively search for EVD among admitted patients on the ward:
 - Take temperatures of all in-patients at least 3 times a day.
 - Twice per day, and whenever a temperature $\geq 38.0^{\circ}\text{C}$ is recorded, assess the patient for symptoms of Ebola: headache, vomiting, nausea, loss of appetite, diarrhea, intense fatigue, abdominal pain, general muscular pain or articular



pain, difficulty in swallowing, difficulty in breathing, hiccoughs. Determine if the patient meets the case definition for a suspect case (Annex 1).

- Document the twice daily assessments; it is recommended that a hospital form be developed for this documentation.
- Patients who are transferred to hospitals from CCCs or ETUs after having been cleared of Ebola should be managed as contacts of cases of EVD. While in hospital, they should be cared for in enhanced precautions, and followed closely for fever and symptoms. If fever develops, they should be classified as a probable case of Ebola.
- If a patient is classified as a suspect or probable Ebola case:
 - Report the case to the local health officer or call the Ebola hotline.
 - Transfer the patient to an ETU or CCC, as per the county protocol. All staff should wear enhanced PPE (Annex 2) when transferring the patient.
 - If transfer to an ETU or CCC is not possible within 2-3 hours, the patient should be moved to the isolation area.
 - The patient's bed, the bathroom/latrine used by the patient, and the immediate area around the bed should be thoroughly cleaned and disinfected by cleaners wearing enhanced PPE.
 - If the patient is confirmed to have Ebola, staff and patients who have had contact with the patient should be followed as contacts.

6. Precautions for health facility laboratory staff

Laboratory technicians and assistants are at particular risk of Ebola infection because they must use sharps (needles and lancets) to obtain blood samples and because they handle other body fluids (e.g. urine).

- Invasive procedures, including blood draws, should be avoided unless absolutely necessary.
- In patients with suspect or confirmed Ebola, blood should only be obtained for EVD testing. This testing should only be performed by laboratory technicians at ETUs/CCCs, or those authorized by county health officials. Blood specimens for EVD testing must be packaged in compliance with biosafety guidelines for transport.
- As much as possible, delegate all blood draws to staff with the most experience.
- Specimen tubes should be labelled and documentation completed before blood is drawn to avoid touching pens, etc. with gloves which have been contaminated.
- When used, needles and sharps should be handled safely and disposed of in safety boxes (Annex 3). Use "auto-disable" syringes and needles if possible.
- Needles must NEVER be reused or recapped.
- If drawing blood or handling a specimen from a patient not suspected of having EVD, **basic PPE** should be worn.
- If drawing blood or handling a specimen from suspect, probable, or confirmed EVD patients, **enhanced PPE** should be worn.
- When moving from one patient to the next, gloves must ALWAYS be changed and hands disinfected with alcohol based hand sanitizer or 0.05% chlorine or soap and running water.

For more information: http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

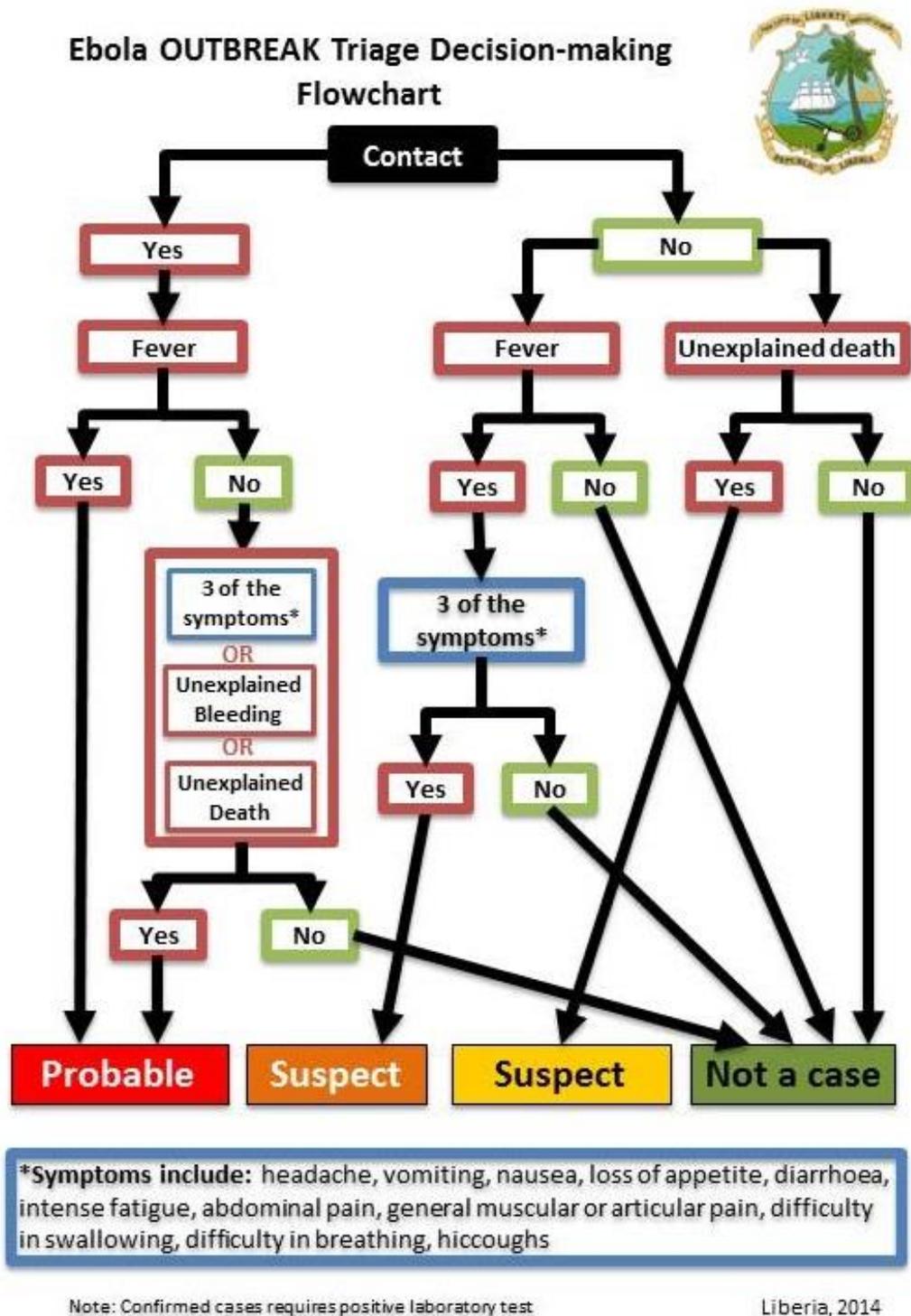


7. Deaths

- If a death occurs in a clinic or health center, call the Ebola hotline to have the burial team remove the body and disinfect the area.
 - Do not touch the body.
 - While you are waiting for the burial team, cover the body with a sheet, and put up a barrier or have a person watch the area to ensure that no person touches the body or the surrounding environment
- If a death occurs in hospital, the infection control officer should be consulted.
 - Call the Ebola burial team to come and remove the body.
 - If the burial team cannot come right away, the body should be covered with a sheet and left in place until the burial team arrives. Alternatively, a staff member who has been trained in safe removal of bodies can move the body to a secured designated room for pick up later by the burial team. Enhanced PPE should be worn while moving the body, and practices described in safe burial protocols must be adhered to.
 - The patient care area should be cleaned and disinfected once the body is removed. Patient clothing and linens should be discarded and incinerated.



Annex 1 – Case definition algorithm



Contact is defined as meeting one of the following criteria:

1. Slept or ate in same household as a suspect, probable or confirmed case of Ebola
2. Direct physical contact with a suspect probable or confirmed case of Ebola or with the body of case after death
3. Touch body fluids of a case the last 21 days (saliva, urine, feces)
4. Manipulation of clothes or other objects that had been touched by a case
5. Breastfeeding of a child who is the case
6. Attendance at the funeral of a case

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Annex 2 - Protective Gear

1. Basic PPE in non-ETU, non-CCC health care settings:

All clinical staff should wear the basic PPE when providing patient care/in patient care areas during the Ebola outbreak. A space should be designated for removal of all PPE and that area should be cleaned and disinfected at least twice per day. There should be a separate, designated place in the facility for all staff to put on PPE.

In addition to routine use of basic PPE, a “no touch/minimal touch” policy should be in place.

a) Equipment:

- Gloves
 - Wear gloves during direct contact with every patient.
 - Wash hands with 0.05% chlorine OR alcohol-based hand sanitizer OR soap and running water BEFORE putting gloves on, and again AFTER taking gloves off.
 - Gloved hands can be washed with chlorine solution (0.5% or 0.05%) OR alcohol based hand sanitizer OR soap and running water. However, washing gloves can increase the risk of tears, so washing gloves should only be used to decontaminate them before removal. Currently, the predominant practice in Liberia is to use chlorine solution for washing gloved hands. Therefore this document will allude to use of chlorine water for this procedure.
 - New gloves should be used for each procedure and each patient. **NEVER** use the same gloves to care for more than one patient. Remove gloves immediately after direct contact with patient and between one patient and another patient, as well as immediately after soiling of the gloves with body fluids.
 - Steps of changing gloves:
 - Clean gloves in 0.05% or 0.5% chlorine.
 - Remove gloves.
 - Clean hands with 0.05% chlorine or with alcohol hand sanitizer
 - Put on a new pair of gloves.
 - Do not touch the face, mouth, eyes, or skin while wearing gloves. Changing gloves and cleaning your hands between patients is the most important element of protection from Ebola. Not touching your face or other parts of your body with gloves that you have used is the second most important element.
- Face Shield
 - Face shields not only protect face and mucous membranes from body fluid splashes, they also reduce touching of face and mucous membranes with potentially contaminated hands
 - Do not touch the face shield with your hands or your gloves (except to don and doff the face shield).
 - Change the face shield immediately if soiled or if you notice that your potentially contaminated gloved hands have touched it.



- Either re-useable or disposable face shields may be used
- If face shields are not available, the combination of goggles and fluid resistant mask is an acceptable alternative
- Fluid-resistant gown
 - Wear a fluid-resistant gown to protect the skin and clothes.
 - The gown should give maximum coverage of the upper body.

All protective equipment should be removed immediately in the order below if there is any exposure to bodily fluids. Otherwise, gloves should be changed between patients as above. The face shield and gown should be removed at breaks or the end of the shift. Re-useable face shields should be cleaned and disinfected after removal.

b) How to wear PPE:

- Put on PPE in the following sequence:
 1. Take off jewelry.
 2. Wash hands with 0.05% chlorine OR alcohol-based hand sanitizer OR soap and running water.
 3. Put on face shield.
 4. Put on gown.
 5. Put on gloves.
- Remove PPE in the following sequence:
 1. Wash gloved hands with alcohol based hand sanitizer or 0.5% or 0.05% chlorine solution
 2. With gloved hands, carefully remove the gown, ensuring that the outside of the gown does not touch your body.
 3. Remove gloves without touching the outside of the gloves with bare hands.
 4. Wash hands with alcohol based hand sanitizer or 0.05% chlorine OR alcohol-based hand sanitizer OR soap and running water.
 5. Remove the face shield by grabbing the side of the head band and lifting the face shield out and downwards and away from the face.
 6. Immediately after removing the face shield, wash hands with alcohol based hand sanitizer or 0.05% chlorine OR soap and running water.

2. Enhanced PPE in non-ETU, non-CCC health care settings

Enhanced PPE is worn for

- Persons entering the isolation area with suspect, probable, or confirmed EVD patients
OR
- Persons delivering or assisting in delivering of babies and persons caring for any pregnant patients with significant vaginal bleeding
OR
- Persons handling dead bodies



- OR
 - Persons cleaning spills of blood or body fluids, or decontaminating isolation areas after patients with suspect/probable/confirmed Ebola have left, or managing waste from Ebola isolation areas.
- The important principle of enhanced PPE is the protection of mucous membranes from contamination. There is more than one means of providing this protection and adaptations may be needed according to the available PPE items. However, whenever an addition or modification is considered to a particular method of putting on and removing PPE, there is a possibility that the risk of accidental self-contamination will be increased. Any proposed additions or modifications should be reviewed by an IPC professional to assess the potential benefits and risks. The protocol should then be written in detail, and workers trained regarding the changes prior to implementation. .
 - a) Equipment:
 - Scrubs
 - Scrubs are optional and used for comfort purposes as the enhanced PPE entails profuse sweating in warm weather. If clothes are worn rather than scrubs, they should be clothes worn only in the hospital.
 - Change out of street clothes into scrubs
 - Rubber boots
 - Wear boots to protect feet and legs.
 - Gloves
 - Wear two pairs of gloves
 - First pair of gloves (under gown cuff). *Note: protection from exposure by separation of gown and gloves can either be achieved by “tethering” the gown/coverall – that is, by creating a thumbhole in the gown/coverall sleeve to keep the sleeve extended the full length of the arm, or by having the outer pair of gloves be a longer glove which is relatively tight fitting and extends onto the forearm. Either (or both) is acceptable. Some coveralls have a designated area of weakness for tethering; using scissors to cut a thumbhole is also acceptable.*
 - Second pair of gloves: glove type depends on care being provided, in all cases. Gloves which are long enough to cover the cuff of the gown are preferred. The second pair of gloves should be changed between patients.
 - a. For general patient care, use any disposable gloves
 - b. For deliveries/examinations of women who are bleeding or may be in labor, use sterile surgical or obstetrical gloves
 - c. For housekeeping, use heavy duty rubber gloves with long cuffs.
 - Wash hands with alcohol based hand sanitizer OR 0.05% chlorine OR soap and running water BEFORE putting gloves on, and again AFTER taking gloves off.
 - Do not touch the face, mouth, eyes, and skin with gloves on.
 - Eye protection: Face Shield or goggles



- Wear a face shield or goggles while working with patients to protect the eyes.
Note: if hoods are worn, goggles are preferred as they can be worn underneath the hood and thus provide eye protection when removing the hood.
 - Face Mask
 - Wear a fluid-resistant medical/surgical face mask to protect the nose and mouth. Face mask should fully cover nose and mouth.
 - A mask with a structured design that does not collapse against the mouth is desirable.
 - Body protection
 - Wear a fluid-resistant gown, or coverall, to protect the body.
 - The gown should give maximum coverage of the upper body.
 - Coveralls without integrated hoods are preferred.
 - Hood
 - Wear a hood to protect the head and neck
 - Apron
 - Wear a plastic apron to provide maximal protection against contaminated fluids.
 - Important characteristic is ease of removal without disturbing facial protection.
- b) How to wear PPE:
- Put on PPE in the following sequence:
 1. Take off jewelry.
 2. Put on scrubs.
 3. Put on rubber boots.
 4. Wash hands with alcohol-based hand sanitizer OR 0.05% chlorine OR soap/water.
 5. Put on the first pair of gloves.
 6. Put on gown or coverall.
 7. Put on face mask.
 8. Put on goggles or face shield.
 9. Put on hood.
 10. Put on outer pair of gloves.
 11. Put on apron.
 - 12. Have someone else observe while putting on PPE and/or check after donning that PPE is correct. Check PPE in mirror.**
 - Remove PPE in the following sequence:
 - **THIS IS THE MOST CRITICAL STEP AND HIGHEST RISK FOR CONTAMINATION!**
 - **A “BUDDY SYSTEM” MUST BE IN PLACE** (i.e., someone to observe and orient each step of removing PPE).
 1. Enter decontamination area by walking through chlorine tray one boot at a time. Make sure that any dirt or soil on the boots is rinsed off in the tray.
 2. Wash gloved hands with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
 3. Remove outer gloves.



4. Carefully remove the apron, ensuring that the outside of the apron does not touch your body. **If re-usable apron:** soak the apron in a bucket containing 0.5% chlorine and hang the apron for further cleaning.
5. Wash gloved hands with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
6. Take off hood.
7. Wash gloved hands with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
8. Remove body protection:
 - a. If wearing gown:
 - i. Carefully remove the gown away from the body and downwards, ensuring that the outside of the gown does not touch your body.
 - b. If wearing a coverall:
 - i. Remove the upper part of suit top to bottom pulling down from outside.
 - ii. Wash gloved hands with alcohol based sanitizer or 0.5% or 0.05% chlorine.
 - iii. Remove the lower part of the suit by rolling down the suit from inside of suit down to heels of boots.
 - iv. Step back and out of suit and dispose.
9. Wash gloved hands (inner gloves) with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
10. Remove goggles by grabbing the straps behind the ears, lean forward, pull the straps out and lift them over your head to move the goggles downwards and away from the face. Put the goggles in 0.5% chlorine to soak.
11. Wash gloved hands (inner gloves) with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
12. Take off face mask by grabbing the elastics behind the ears, then lean forward, pull the straps out and lift them over your head to move the face mask down and away from the face.
13. Wash gloved hands with alcohol-based hand sanitizer OR 0.5% or 0.05% chlorine.
14. Take off the inner gloves (2nd pair), without touching the outside of the gloves with bare hands.
15. Immediately wash hands with alcohol-based hand sanitizer OR 0.05% chlorine OR soap and running water
16. Step into the boot bath to decontaminate boots that may have been re-contaminated in the doffing process.

8. PPE for Cleaning staff in regular (non-ETU, non-CCC) health care settings:

- Type of PPE

1. Enhanced PPE (as described above) should be worn for cleaning in the following areas/circumstances:
 - labor and delivery wards
 - isolation areas when they are or have been occupied by a patient with suspect/probable or confirmed Ebola
 - Laboratory areas, and



- Spills of blood and body fluids.
- 2. Basic cleaning PPE is worn for all other cleaning in areas of clinics where patient care is delivered. Equipment for basic PPE for cleaning is the same as that for basic PPE for caregivers, with the exception that reusable heavy duty gloves and boots are worn.
 - Gloves- Heavy duty rubber gloves should be worn
 - Check gloves for leaks by immersing them in water when they are first put on
 - Face Shield
 - Wear a face shield
 - Fluid-resistant gown or coverall
 - Wear a fluid-resistant gown to protect the skin and clothes.
 - The gown should give maximum coverage of the upper body.
 - Rubber Boots
 - Wear boots to protect feet and legs.

b) How to wear Basic PPE:

- Put on PPE in the following sequence:
 1. Take off jewelry.
 2. Put on boots.
 3. Wash hands with 0.05% chlorine OR alcohol-based hand sanitizer or soap and running water
 4. Put on gown or coverall.
 5. Put on face shield.
 6. Put on heavy duty rubber gloves.
- Remove Basic PPE in the following sequence:
 1. Decontaminate boots in a basin of 0.5% chlorine.
 2. Wash gloved hands (outer rubber gloves) with 0.5% or 0.05% chlorine.
 3. With gloved hands, carefully remove the gown or coverall, ensuring that the outside of the gown does not touch your body.
 4. Wash gloved hands with 0.5% or 0.05% chlorine.
 5. Remove gloves.
 6. Remove the face shield by grabbing the side of the head band and moving the shield downwards and away from the face.
 7. Wash hands with alcohol-based hand sanitizer or 0.05% chlorine OR soap and running water.



Annex 3 – Standard Precautions for all health care settings, including clinics, health centres, and hospitals

Standard precautions are meant to reduce the risk of transmission of bloodborne and other pathogens from both recognized and unrecognized sources. They are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients.

1. **Hand hygiene:** The most important measure to prevent transmission of infections is to practice routine hand hygiene before and after every patient encounter. Alcohol-based hand sanitizer, diluted bleach (0.05%), soap and running water are all effective means of hand hygiene.
2. **Handle needles and sharps safely**
 - Use “auto-disable” syringes and needles where possible
 - Do not separate used needles from syringes.
 - Put needles and sharps in puncture resistant sharps container.
 - Do not re-cap needles.
 - Do not re-use needles or syringes.
 - Dispose of sharps container in sharps pit.
3. The use of **PPE** should be guided by **risk assessment** and the extent of contact anticipated with blood and body fluids, or pathogens as follows:
 - **Gloves**
 - Wear when touching blood, body fluids, secretions, excretions, mucous membranes, non-intact skin.
 - Change between tasks and procedures on the same patient after contact with potentially infectious material.
 - Remove after use, before touching non-contaminated items and surfaces, and before going to another patient. Perform hand hygiene immediately after removal.
 - **Gown**
 - Wear to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
 - Remove soiled gown as soon as possible, and perform hand hygiene.
 - **Facial protection (eyes, nose, and mouth)**
 - Wear (1) a surgical or procedure mask and eye protection (eye visor, goggles) or (2) a face shield to protect mucous membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.



Annex 4–Cleaning and Disinfection for Ebola in all health care settings, including clinics, health centres, and hospitals

Disinfection principles

- During the Ebola outbreak in Liberia, decontamination is performed using 0.5% and 0.05% chlorine. Chlorine at higher concentrations is more effective at disinfection, and requires a less time to kill viruses. However, it is toxic and may damage some equipment.
- 0.5% chlorine is used for disinfection of all items, equipment and surfaces in isolation areas, with the exception of linen and scrubs. Uses of 0.5% chlorine:
 - Whenever possible, 0.5% chlorine is used for surfaces and equipment which cannot be soaked for 30 minutes. Some equipment – e.g. infrared thermometers – will be damaged by 0.5% chlorine and must be disinfected with 0.05%.
 - 0.5% chlorine is also used for covering blood and body fluid spills, is added to buckets of waste, and is used to remove other soil from potentially contaminated equipment. This will likely destroy some virus, but protein material degrades active chlorine. Thus any potentially contaminated item with visible soil should be disinfected and cleaned promptly by users wearing enhanced PPE, even if it has been covered with 0.5% chlorine.
 - 0.5% chlorine is used for initial decontamination of PPE, and other equipment that has been used in isolation areas or for patients who are identified as suspect/probably cases of Ebola.
 - 0.5% chlorine is used to dip patients' dishes and utensils to decontaminate them before they are washed.
 - 0.5% chlorine is used for initial and final decontamination of surfaces (e.g. beds, mattresses, chairs, etc.) in isolation areas where soaking is not possible.
- Uses of 0.05% chlorine
 - 0.05% chlorine is used for scrubs and linen from isolation areas which is not visibly soiled, and dishes and utensils. For effective disinfection, soil must be removed, and all items soaked for 30 minutes.
- Cleaning supplies (buckets, mops etc.) used for isolation areas MUST not be used in other areas of the hospital
- Cleaning staff should always wear basic PPE when cleaning the hospital. Enhanced PPE must be worn in the delivery room, in isolation areas and when cleaning blood and body fluid spills.
- At the end of each day, all cleaning equipment: buckets, mops, etc. must be washed in soapy water and disinfected with 0.05% chlorine (soak mop heads for 30 minutes).

During the Ebola outbreak, cleaning and disinfection in patient care areas has three steps:

- Initial cleaning or decontamination – this process uses 0.5% chlorine. It is used always if an item or surface is soiled from blood and body fluids, and always in isolation areas. It is not needed in other hospital areas.
- Washing – this step is performed with soapy water.
- Disinfection – this step is performed with 0.05% chlorine.
- Once the washing and disinfection process is complete, the item or surface is ready for



reuse. Note, however, that items, particularly housekeeping items such as buckets and mops, that have been used in the isolation area should NEVER be used in other areas of the health facility.

Disinfection procedures:

- Prepare 0.5% and 0.05% chlorine solution: Cleaning staff should wear basic PPE when preparing chlorine solution, and this should occur in an open space.
- Chlorine solutions should be made at least daily, and used only for a single purpose (e.g. if used for glove decontamination, it should not be reused for disinfection of spills).
- At the end of each day, all chlorine solutions should be discarded, as the active ingredient degrades.

Chlorine solution	How to Make	Uses
0.5%	70% HTH Chlorine Powder: 10 spoons of chlorine powder in 20 Liters of water (approximately 5 gallons) of water	Disinfection of: - Body fluids, excreta, vomit, - Corpses - Toilets and bathrooms - Floors - Beds & mattress covers - Rubber boots. - Plates, cups and eating utensils. - Gloved hands
	5% Liquid Bleach: 2 liters of 5% liquid bleach in 20 Liters of water	
0.05%	70% HTH Chlorine Powder: 1 spoon of chlorine powder in 20 Liters (approximately 5 gallons) of water	Disinfection of: - Bare hands, skin and shoes. - Thermometers. - Laundry. -
	1 liter of 0.5% chlorine solution in 10 Liters water	

- Cleaning of patient rooms, not in isolation area
 - After cleaning the patient room with soapy water, disinfect all surfaces with 0.5% bleach or chlorine water.
- Cleaning of re-usable equipment used for enhanced precautions (heavy duty gloves, aprons, re-usable face shields):
 - Soak for 30 minutes in 0.5% chlorine, ensuring contact with all surfaces, and removal of any soil and allow to dry.
- Cleaning of items soiled with blood or body fluids:
 - carefully cover the item with 0.5% chlorine for 30 minutes
 - rinse to remove soil completely
 - clean with soap and water
 - soak in 0.05% chlorine for 30 minutes and allow to dry OR (if the item cannot be soaked) disinfect with a clean rag soaked in 0.5% chlorine.
- Disposal of patients excreta, vomit, urine in a bucket or other container
 - Add 0.5% chlorine to the container to cover contents and discard in latrine.



- Rinse with 0.5% chlorine until visible contamination is no longer present.
- Wash container with soapy water and discard in latrine, remembering to wash the outside of the bucket/container.
- Rinse container with 0.5% chlorine; disinfect the outside of the container with 0.5% chlorine (container may then be re-used).
- Management of spills of blood or body fluids:
 - Always wear enhanced PPE when cleaning up spills of blood or body fluids
 - Pour 0.5% chlorine on to a rag until it is soaking, then use the rag to cover the spill; make sure the rag covers all of the contaminated area
 - Disinfect the area around the spill with 0.5% chlorine
 - Let stand for 15 minutes.
 - Remove fluids with clean rag (soaked in 0.5% chlorine) or paper towels.
 - Discard rags in plastic bag for infected waste.
 - Wash area with soap and water.
 - Disinfect again with 0.5% chlorine solution.
- Disinfection of patient clothing and bedding (patients who are NOT suspect/probable/confirmed Ebola)
 - Used linen should be handled carefully to prevent contamination of surrounding surfaces or people.
 - Linen which is not visibly soiled should be soaked in 0.05% chlorine for at least 30 minutes, then washed in soapy water and dried on a line in the sun.
 - If linen/clothing is visibly soiled, any solid matter should be removed and either flushed down a nearby toilet or collected in wet waste container (bucket), to be treated then by standard protocol. The soiled linen should then be placed immediately into a leak proof plastic bag.
 - Soak soiled clothing/linen in 0.05% chlorine for at least 30 minutes, then wash in soapy water and soak again in 0.05% chlorine for at least 30 minutes.
 - Dry on line in the sun.
- Linen and or clothing from patients with suspect/probable/confirmed Ebola should be put in a leak proof plastic bag, and then burned.
- Disinfect patients plates, cups, and utensils
 - Throw away leftover food.
 - Dip the plates, cups, and utensils into a bucket filled with 0.5% chlorine.
 - Wash plates, cups, and utensils with soap and water.
 - Rinse with clean water.
 - Leave plates, cups, and utensils into a bucket of 0.05% chlorine for 30 minutes.
 - Let dry in the sunlight.



Annex 5 - Waste management in health care settings

General Considerations

- Waste classification is key to ensuring that it is handled correctly and disposed of through the appropriate channel.
- Health-care workers should wear PPE whenever handling waste and should perform hand hygiene immediately after removing PPE.
- Health-care workers should take care to avoid aerosolization of matter whenever handling and disposing of the waste. This is especially important for feces. For instance, body fluid spills should be covered with a cloth soaked in 0.5% chlorine rather than sprayed; if chlorine is poured into a bucket of waste care should be taken to avoid splashing; walls should be washed using rags soaked in chlorine rather than by spraying with a hose.
- Waste bags and bins should never be carried against the body (e.g., on the shoulder).
- The area designated for the final treatment and disposal of waste should have controlled access to prevent entry by animals, untrained personnel or children.

Waste classification:

- General waste – such as leftover meals, office waste (e.g. paper)
- Solid (infectious) clinical waste WITHOUT sharp objects - such as material used during wound care, disposable PPE items (e.g., mask, medical gloves, disposable gown)
- Solid (infectious) clinical waste WITH sharp objects - such as, needles, syringes, bistouries' blades, glass articles AND tubing that has been in contact with blood or body fluids
- Liquid (infectious) waste are patients excreta, vomit, urine, blood
- Anatomic pieces - such as placenta
- Used chlorine solutions

Collection of waste: (each type of waste should be in a separate waste bag or bin)

- General waste – collected in a waste bag or bin.
- Solid (infectious) clinical waste WITHOUT sharp objects - leak-proof waste/refuse bags and covered bins.
- Solid (infectious) clinical waste WITH sharp objects - placed inside puncture resistant waste containers.
- Liquid (infectious) waste should be collected in water-proof container of sufficient size to limit the risk of spilling and having a cover/tamp (e.g. bucket)
- Anatomic pieces – collected in a covered bucket.

Waste Disposal:

- General waste - should be placed in a designated pit of appropriate depth (e.g., 2 m or about 6feet) and filled to a depth of 1–1.5 m (or about 3–5 feet). After each waste load, the waste should be covered with a layer of soil 10 –15 cm deep
- Solid (infectious) clinical waste (non-sharp and sharp) should preferably be **burned**. An available incinerator can be used during an outbreak to destroy solid (infectious) clinical waste. However, it is essential to ensure that total incineration has taken place. It is therefore imperative that only solid (infectious) clinical waste (see waste classification above) is put into the incinerator (e.g., food leftover will not burn and hamper the entire



incineration process). Caution is also required when handling flammable material and when wearing gloves due to the risk of burn injuries if gloves are ignited.

- Liquid (infectious) waste should be disposed of, after decontamination with 0.5% chlorine, through toilets or latrines.
- Placenta and anatomical samples should be buried in a separate pit.