National Ebola preparedness and response plan

Cayman Islands

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List of abbreviations and acronyms

CIEMS	Cayman Islands Emergency Medical Services
EMS	Emergency Medical Services
EVD	Ebola virus disease
IHR	International Health Regulations
NSAID	Non-steroidal anti-inflammatory drug
PPE	Personal Protective Equipment
PUI	Person Under Investigation
WHO	World Health Organization

Definitions

Close Contact Definition

1- Being within approximately 3 feet (1 meter) of an EVD patient or within the patient's room or care area for a prolonged period of time (e.g. health care personnel, household members) while not wearing recommended personal protective equipment (PPE); **or**

2- Having direct brief contact (e.g. shaking hands) with and EVD patient while not wearing recommended PPE.

Brief interactions, such as walking by an infected person or moving through a hospital, do not constitute close contact.

Conditional release

People are monitored by a public health officer or a healthcare provider for 21 days after the last known potential exposure to the Ebola virus, to ensure that immediate actions are taken if they develop symptoms consistent with EVD during this period. People conditionally released should self monitor for fever twice daily and notify the public health department if they develop fever or other symptoms; additionally, these individuals will be visited at least once daily by a public health officer or a health care provider for temperature reading/recording and assessment.

Controlled movement

Controlled movement requires people to notify the public health department about their intended travel for 21 days after their last known potential Ebola virus exposure. These individuals should not travel by commercial conveyances (e.g. airplane, ship, long-distance bus). Local use of public transportation (e.g. taxi, bus) by asymptomatic individuals should be discussed with the public health department; if travel is approved, the exposed person must have timely access to appropriate medical care if symptoms develop during travel. Approved long-distance travel should be by chartered flight or private vehicle; if local public

transportation is used, the individual must be able to exit quickly. In the Cayman Islands, all exposed personnel should be quarantine for a period of 21 days (either at home with security/police in place to prevent the individual(s) from leaving the place, or at a health care or designated facility).

Ebola Virus Disease (EVD) case definition

Person Under Investigation (PUI)

1- Clinical criteria: fever of greater than 38.6 degrees Celsius or 101.5 degrees Fahrenheit plus other symptoms such as severe headache, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained haemorrhage; **and**

2- Epidemiological risk factors within the past 21 days before onset of symptoms, such as contact with blood or other body fluids or human remains of a patient known to have or suspected to have EVD; residence in, or travel to, an area where EVD transmission is active; or direct handling of handling of bats and/or non-human primates from disease endemic areas.

Probable case

A PUI whose epidemiologic risk factors include high or low risk exposure(s) (see algorithm below)

Confirmed case

A case with laboratory confirmed diagnostic evidence of Ebola virus infection

Quarantine

Is used to separate and restrict the movement of persons exposed to a communicable disease (e.g. Ebola) who don't have symptoms of the disease (for the purpose of monitoring, as above).

Self-monitoring

People check their own temperature twice daily and monitor themselves for other symptoms. In the Cayman Islands, the visit of a Public Health Officer or a health care provider at least once daily is recommended.

Standard precautions

The minimum level of infection control required in the treatment and care of all patients in order to avoid direct contact with blood and/or body fluids.

I. INTRODUCTION

Purpose

To standardize the processes for identification and management of patients with EVD across the healthcare sector of the Cayman Islands.

Background

Ebola virus disease (EVD) is a severe illness caused by the Ebola virus which is one of three members of the *Filoviridae* family. There are five distinct species of Ebola virus, four of which have caused disease in humans: Zaïre, Sudan, Tai Forest and Bundibugyo. EVD is highly infectious and rapidly fatal, with a death rate of up to 90%.

The virus is introduced into the human population through close contact with the blood, body fluids and secretions of infected animals. In Africa, infection has been documented through the handling of infected animals (chimpanzees, gorillas, fruit bats, monkeys, pigs, forest antelopes and porcupines) found ill, dead or alive in the rainforest.

Following the introduction of Ebola virus in the human population it can spread in the community via direct or indirect contact. Direct human-to-human transmission occurs when there is contact with blood or other body fluids (such as saliva, urine, vomitus and stool) from infected people, dead or alive. This includes unprotected sexual contact for up to seven weeks, as the virus is found in semen up to seven weeks after recovery from the illness. Contact with objects that have been contaminated such as razors, needles or soiled clothing or bed linen contributes to indirect spread.

The Ebola virus can be relatively easily eliminated with heat, alcohol-based products, and sodium hypochlorite (bleach) or calcium hypochlorite (bleaching powder) at appropriate concentrations.

On 8th August 2014, the World Health Organization declared the Ebola Virus Disease outbreak in West Africa a 'Public Health Emergency of International Concern'. Coordinated public health actions are essential to stop and reverse the spread of the Ebola virus to other countries. A total of 22,495 confirmed, probable, and suspected cases of EVD, and 8,981 deaths were reported in nine affected countries up to 1st February 2015.

On 17th July 2019, the World Health Organization declared the Ebola Virus Disease outbreak in the Democratic Republic of the Congo a 'Public Health Emergency of International Concern'. A total of 2,501 confirmed, probable, and suspected cases of EVD, and 1,668 deaths have been reported to 16th July 2019. Coordinated public health actions

are essential to mitigate further spread to neighboring and international countries. To date there have been no reported cases in the Caribbean.

Although the risk for the Cayman Islands remains low, the Cayman Islands are, and will remain on alert to prevent its entry to the Cayman Islands and to contain it in the unfortunate event of an occurrence in Cayman.

Ebola Facts

While Ebola is a dangerous virus that can be life threatening, its spread can be contained.

Transmission

- EVD is spread by contact with blood or any other body fluid from a person with symptoms of EVD infection. Infection is spread when infected body fluids come in contact with mucous membranes, breaks in the skin or by sharps injuries.
- EVD is not transmitted through the air unless there is exposure to body fluid droplets from an infected person (e.g. coughing, sneezing or spitting).
- EVD is not transmitted from persons who don't have symptoms of infection (see below for symptoms of EVD infection).

Symptoms

Some of the symptoms of EVD are similar to those of other infections that are common in West Africa, such as malaria and diarrheal illnesses.

- EVD usually starts with a sudden onset of fever along with symptoms, including chills, weakness, abdominal pain, joint muscle aches, headache, lack of appetite and body aches. Vomiting and diarrhoea are common. In severe cases, internal and external bleeding may occur.
- The illness begins an average of 8-10 days following exposure (although it could be from 2 to 21 days).

- There currently are no medications specific for treating Ebola virus infection.

Treatment

The goal is to provide this care to the patients until their bodies can control the virus. The main way we treat EVD is through supportive care. This means providing excellent medical and nursing care, including monitoring and replacing fluids and electrolytes, as well as transfusions as necessary.

II. PREPARATION

Establishment of an EVD surveillance system

- Routine surveillance at point of entry
- Collection, packaging, storage and shipment of specimens
- National coordination mechanism, epidemic management committees and rapid response teams

Staff preparation and training

- **Healthcare professionals**
- Education
    - System-wide education for risk assessment, triage and care of high-risk patients will be provided at points of entry into the HSA. This will include training in the donning and doffing of PPE. Competency verification will be documented by the Infection Control Coordinator.
- Infection control
- Patho-physiology
- Nursing Care
- Border control personnel
- Security personnel

Identification and Preparation of Facilities for Quarantine and Isolation

- Location
- Furniture
- Beds
- Overbed table
- Chairs
- Desks

- Shelving
- Wall clock

Equipment

- Ventilator
- Suction
- I STAT
- Thermometer
- Sphygmomanometer
- iPads
- Video-camera with intercom

Supplies

- Medical-Surgical
- Pharmaceuticals
- Housekeeping/Hygiene

Infection control precautions in health care settings

- Standard infection control precautions
- Personal protective equipment

Community Awareness

- Education and information on EVD

III. RISK ASSESSMENT

Because travel to high-risk areas is one of the risk factors for transmission, these guidelines address patients who are considered at high risk for EVD who meet travel criteria. In addition, exposure to a known EVD patient has also been included in the assessment. This document should be used in conjunction with the EVD screening algorithms in place for the ED, at ports of entry or any other clinics or hospital. Upon initial arrival to one of these entry points into the system, patients will be screened for a positive travel history and symptoms consistent with EVD. Patients are stratified as high, intermediate, or low risk for EVD based on the exposure risk assessment along with clinical findings.

The categories are as follows:

High-risk of EVD

- High-risk exposure (defined below) plus ANY symptoms suggestive of EVD (fever [subjective or $\geq$ 38 degrees C, 100.4 degrees F] and/or other symptoms, including severe headache, muscle pain, vomiting, diarrhoea, abdominal pain, bleeding). High-risk exposure is defined by the CDC as:
    - Percutaneous (e.g., needle stick) or mucous membrane exposure to body fluids of confirmed or suspected EVD patient
    - Direct care of an EVD patient or exposure to body fluids from such a patient without appropriate personal protective equipment (PPE)
    - Processing body fluids of confirmed EVD patients without appropriate PPE or standard biosafety precautions
    - Direct contact with a dead body without appropriate PPE in a country where an EVD outbreak is occurring

- Low-risk exposure (defined below) plus high probability of infection based on clinical assessment. Low-risk exposure defined by the CDC as:
    - Household contact with an EVD patient
    - Other close contact with EVD patients in health care facilities or community settings.
    - Close contact is defined as:
        - Being within approximately 3 feet (1 meter) of an EVD patient or within the patient's room or care area for a prolonged period of time (e.g. health care personnel, household members) while not wearing recommended PPE (i.e., standard, droplet and contact precautions)
- Having direct brief contact (e.g. shaking hands) with an EVD patient while not wearing recommended PPE
    - NOTE: Brief interactions, such as walking by a person or moving through a hospital, do not constitute close contact
    - High probability of clinical EVD is based on compatible clinical symptoms (fever; diarrhoea; unexpected bleeding; laboratory findings, including low platelet count; absence of alternative diagnoses) and ID clinical assessment
- Rapid Ebola virus testing should be performed on any patient with high risk of EVD with disposition (admission to SCDU) driven by test results. If rapid testing cannot be done or if symptoms have been present for < 48 hours at time of testing, admission to SCDU maybe authorized by the on-call SCDU ID.

Intermediate-risk of EVD

- Low-risk exposure plus
    - Clinical syndrome not highly suggestive of EVD that may or may not include fever or with an alternative diagnosis (such as malaria) with ongoing symptoms or with compatible clinical illness with negative rapid Ebola virus test performed within first 48 hours of symptoms
    - Evaluation should include extensive work-up for alternative diagnoses, rapid Ebola virus test for those with any compatible symptoms or follow-up Ebola virus test for those with negative test performed early after onset of symptoms
    - Disposition of patient may require conference between screening ID clinician and on-call SCDU ID.

Low-risk of EVD

- No known exposure to EVD plus any travel to affected country plus compatible symptoms developing in the appropriate time frame after travel/return from affected country (2-21 days, peak 8-10 days)
- Evaluation should consider:
    - Time/duration of exposure in country with EVD
    - Updated information on transmission within countries (e.g. if no cases occur in a country for 2 incubation periods (42 days), the country can be considered EVD- free)
    - Where patient was in country with EVD, reason for stay in country (funeral of family member for example)

- Exposure to anyone with clinical illness
- Receipt of malaria prophylaxis
- Low-risk patients should receive appropriate evaluation for likely cause of clinical syndrome. Necessity of performing Ebola virus testing should be considered on a case-by-case basis. Ebola virus testing requires approval of on-call SCDU ID.

IV. SURVEILLANCE PROCEDURES AT PORTS OF ENTRY

As per International Health Regulations (2005) and the Cayman Islands Quarantine Regulations (2011) a health declaration by the carriers (airlines and ships) is essential that will be communicated through Traffic Control to Public Health Department directly or through 911 and HSA A&E Department.

- Department of Immigration in conjunction with the Public Health Department had introduced a Travel Health questionnaire that has to be filled out by all arriving passengers (appendix I)
- If the traveller has arrived from the Democratic Republic of the Congo, and if the passenger appears well, the person will be placed in the Public Health office in the arrival hall and the HSA team will be contacted or if the person is unwell, 911 will be contacted as per the Guidance for Ebola Assessment by Border Staff algorithm (appendix II)
- The EMS Team will assess the passenger through Health Screening questionnaire for arriving passengers (appendix III) to elicit exposure history and take temperatures using the equipment they have as per the EMS protocol
- If the passenger did not have any fever or other symptoms, if a visitor, will be denied of entry and quarantined until departure. If a resident, the passenger will have an option to be quarantined in a designated place at the CI Hospital or in their own home if all household members were passengers or if living alone (supervised by security guards)
- If quarantined in the CI Hospital – the resident is guarded by a security guard and arrangements for daily needs are met at the CI Hospital similar to an inpatient
- If quarantined at home, arrangements will be made to assist the passenger or family for daily needs

- The passenger will be given info re the reasons for quarantine and the Ebola information and self-monitoring. Quarantine notice (appendix IV) will be served by the Medical Officer of Health
- The quarantined person is to inform the security guard or contact the telephone number on the quarantine notice if they become unwell at any time or for any concern or need
- During quarantine period, the EMS team will monitor the temperature twice a day around 8:00 a.m. and 8:00 p.m. and the record is kept on the monitoring form (appendix V)
- If at any time the person has temperatures of 101˚F, the person will be moved to an isolation room and managed as a suspect case
- Contact with PAHO/CARPHA/CDC for guidance on the next steps.

Appendix I

(All passengers arriving in the Cayman Islands are to complete questionnaire and immediately present to an Immigration Officer along with Immigration and Customs Landing form without delay)

TRAVELER'S QUESTIONAIRE

IMMIGRATION
CAYMAN ISLANDS

(1) **Have you spent any time in Africa in the past four weeks?** Yes ☐ No ☐

(2) **If yes, please state the countries visited and dates:**

(3) **Did you care for or were you in contact with an Ebola patient?** Yes ☐ No ☐

If yes, details:

Appendix II

Public Health Department
HEALTH SERVICES AUTHORITY
CAYMAN ISLANDS
Caring People. Quality Service.

Department of Immigration
Cayman Islands

There is currently a widespread outbreak of Ebola virus disease occurring in the Central African country of the Democratic Region of the Congo.

Ebola is a rare but serious viral infection, spread person to person by direct contact with blood and body fluids of infected people. The incubation period of Ebola ranges from 2 to 21 days, and so whilst unlikely, it is not impossible that a person infected in the Democratic Region of the Congo could arrive in the Cayman Islands (an individual infected with Ebola may arrive in the Cayman Islands with symptoms which began prior to departure or with symptoms that developed in transit or they may arrive before developing any symptoms). As a general precaution, it is recommended that all Border staff (Immigration, Customs etc.) cover any cuts or abrasions on exposed skin with a waterproof plaster while on duty.

There is a possibility that a passenger arriving in the Cayman Islands has travelled directly or indirectly from the affected country in Central Africa. In order to assist in the identification of any potentially infected individuals, the attached algorithm has been developed specifically for Border staff with direct contact with incoming passengers.

Further information about the Ebola virus outbreak can be found on the following webpages:

Cayman Islands Health Services Authority - www.hsa.ky

Public Health England (including the outbreak and maps of affected area):
http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Ebola/

World Health Organization (WHO):
http://www.who.int/csr/disease/ebola/en/index.html

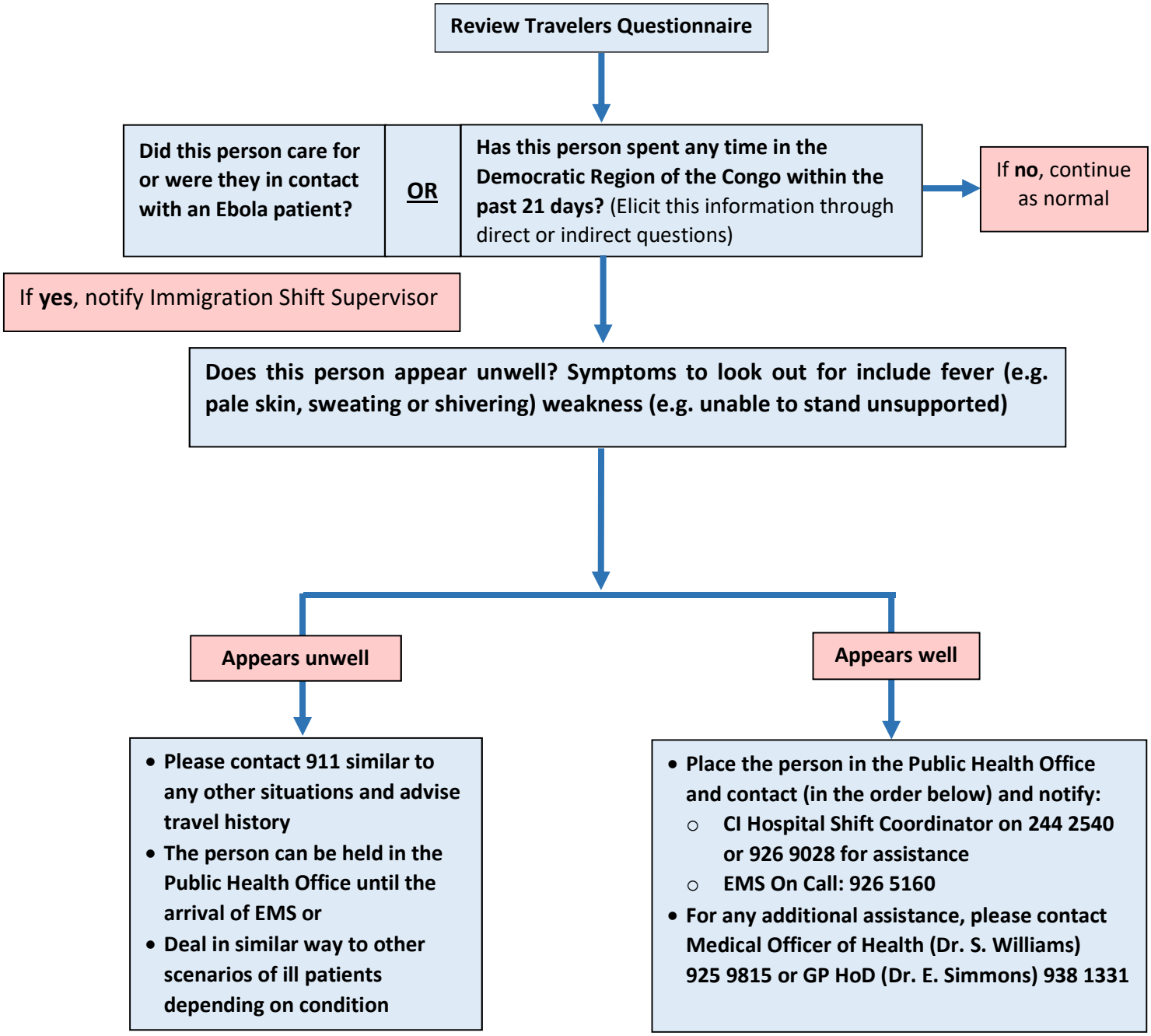
Caribbean Public Health Agency:

www.carpha.org

Center for Disease Control and Prevention (CDC):

http://www.cdc.gov

Ebola assessment by Border Staff - Algorithm



NB: The numbers listed can also be contacted for any clarification needed.

V. TRANSPORT OF ANY INDIVIDUALS WITH A POSSIBILITY OF BEING A PERSON UNDER INVESTIGATION (PUI)

a) Cayman Islands EMS Ebola Preparedness/ Operational Procedure

CALL PRE-SCREENING/PLANNING

The 911 Communication Department will be responsible for the initial screening and will notify EMS personnel in a timely manner.

As the Cayman Islands' only Emergency Medical Services we must prepare to mitigate against the potential transfer of any suspected or confirmed Ebola patients to the designated facility (HSA). To assure patient, public and employee safety, such a transport must be carefully planned. The steps below describe the operational procedure to follow:

Any suspected case highlighted by the 911-communication center must take the following action points below prior to patient contact when possible:

- Notify both the EMS Manager and Clinical Medical Director**.** The purpose of this call is to clarify the patient's diagnosis and discuss the patient's acuity and treatment plan. It will also be important to establish that the patient's condition is stable enough for transport.
- Assure that the A&E/Online medical control is aware of the patient's status and has the appropriate team to receive the patient. Confirm the timing of the transport.

PERSONAL PROTECTION

Various means of protection will include protecting the Caregiver from all routes of entry using PPE, barriers in the patient compartment of the ambulance, proper decontamination of the ambulance/equipment and proper disposal of the waste generated. The following guidelines will be observed during these processes.

- Isolation of the ambulance surfaces in the Patient Compartment while making available necessary patient care equipment.
- Wearing of appropriate PPE: Caregivers should wear: (impermeable gowns), eye protection (goggles which seal the orbital area with face shield), double glove and disposable shoe covers.
- N95 or (P100 will be provided) respirators will be worn from initial patient contact through completion of decontamination.
- Prudent hand washing.
- No aerosol-generating procedures, such as airway placement, administration of nebulized medications, tracheal suction, CPAP, etc should not be performed during transport
- No IV will be attempted during transport.

AMBULANCE PATIENT COMPARTMENT PREPARATION

Ambulance preparation will be done with the purpose of segregating the cab from the patient compartment and covering the cabinetry/shelving, ceiling, seating and floor with an impermeable barrier.

Supplies:

- 6 ml clear plastic sheeting
- Large plastic garbage bags
- Duct tape
- Scissors

Procedures:

All sheeting should overlap prior sheets of plastic by a minimum of 1 inch. All seams should be sealed completely by duct tape.

1. Cover the ceiling of the patient compartment with plastic sheeting and affix with duct tape.
2. Place sheeting on the floor of the rig and affix to bench seat, jump seat and walls to create a bowl affect in an effort to channel any body fluids toward the center of the floor causing fluids to collect in one area.
3. Place plastic sheeting over the walls (sides and bulkhead) by affixing it to the edges of the sheeting for the ceiling and floor with duct tape to enable any flow of fluid to be captured on the sheet on the floor.
4. Wall sheeting should overlap with the upper portion over the lower portion to prevent any body fluid from leaking between sheets by gravity.
5. The gurney antlers and clamp will need to be accessible through the plastic sheeting for safe transport of the gurney and patient. Seal these openings generously with duct tape so that all fluids flow to the sheeting on the floor.
6. Leave openings around ventilation ports to allow proper airflow and exchange.
7. Continue to overlap sheeting down and over seating to the floor. Cover rear doors with plastic sheeting and duct tape.

GURNEY PREPARATION

Supplies:

- Impermeable mattress cover or Large Garbage Bags and Duct Tape. NB: **no paper sheets**. Cover mattress pad with fitted impermeable mattress cover.

AMBULANCE CAB

Supplies:

- Backup EVD PPE kit or equivalent
- N95 or P100 respirator
- Impermeable decontamination disposal sheet
- Multiple red biohazard bags
- Extra gloves and shoe covers

CREW PREPARATION

EVD patient transports will be done by three person crews. The third crewmember, 'driver', will assume no patient contact nor enter the patient compartment, to remain decontaminated during the transport and to avoid contamination of the cab area.

Prior to patient contact, each patient caregiver will don the PPE while the third crewmember assists by both checking for integrity issues or exposed body parts.

Supplies:

- EVD PPE Kit Available & N95/P100 respirator

Or

- Impermeable suit
- Goggles
- N95 or P100 respirator
- Face shield
- Gloves X2 (double glove) nitrile
- Additional shoe covers

FACILITY ARRIVAL

Driver will notify the HSA of arrival and don PPE.

Throughout movement of patient into facility, the patient care crew will take steps to prevent secondary contamination of any surfaces, such as avoiding the touching doors handles with contaminated gloves.

Procedure:

1. After notifying HSA staff of arrival, coordinate for the transfer of the patient from the ambulance into the designated location.
2. The following items may be considered with regard to the movement of the patient from the ambulance into the appointed area:

    - The driver should take all precautions to remain a safe distance from the patient to avoid contamination. The driver may assist by opening doors and clearing the path for patient movement.
    - The driver will take decontamination and disposal sheet placing it on the ground at rear of unit with a change of shoe coverings and gloves available for the patient crew.
    - Any body fluid contamination on gurney wheels will be disinfected with appropriate disinfectant such as CaviCide or pre mixed Bleach solution.
    - The Patient will be transferred into hospital by patient crew at the direction of HSA staff.
    - Patient crew will remove and dispose of PPE in the HSA isolation area at their direction following infection control procedures or on the decontamination sheet at the rear of the unit.
    - The gurney and all equipment will be considered infectious and handled with the appropriate PPE until properly decontaminated.
    - The decontamination sheet, PPE, materials and equipment will be collected and double bagged with Red Biohazard Bags at the ambulance observing body fluid precautions and then placed in the rear of the ambulance for proper decontamination and disposal later.

AMBULANCE DECONTAMINATION

The Ambulance should be decontaminated onsite at the pre-assigned location. We also need to consider an indoor facility to prevent contaminated materials from incidentally being blown away or protecting it from weather.

Supplies:

- Impermeable decontamination sheet
- Approved tuberculocidal disinfectant such as CaviCide or 1:10 Solution of bleach to water, allowed to dry for 10 minutes
- Disposable rags
- Red biohazard bags
- EVD containers or red biohazard containers labelled 'Class A infectious waste'
- EVD PPE kit or equivalent

Decontamination Procedures:

1. Don necessary EVD PPE.
2. Lay impermeable decontamination sheet on the ground at the back of the ambulance and side doors and have EVD containers available.
3. Clean up any body fluids and double bag (red biohazard bags) cleaning materials placing those materials in EVD containers.
4. EVD containers should be red bio hazard containers labelled 'Class A infectious waste' and maintained separate from all other red bag waste.
5. Double bag (red bio hazard bags) all disposable materials/equipment and place into EVD containers.
6. Place equipment including gurney antlers on decontamination sheet for proper disinfecting.
7. Remove any contaminated materials from equipment and disinfect equipment using recommended disinfectant and place on clean sheet for drying.
8. Double bag (red biohazard bags) all contaminated rags/wipes into properly labelled red bio hazard bags.
9. Remove impermeable barriers from unit and double bag (red bio hazard bags) placing those properly labelled EVD containers.
10. Fold decontamination sheets and double bag (red bio hazard bags) placing those in proper EVD containers.
11. Place new contamination sheets out.
12. Wipe down all surfaces inside ambulance and outside door handles with recommended disinfectant and double bag (red bio hazard bags) materials placing them in properly labelled EVD containers.
13. Remove PPE and place PPE in double bag (red bio hazard bags) and place in EVD containers.

14. Using gloves, fold decontamination sheets, place in double bag (red bio hazard bags) with PPE and put into EVD containers.
15. Wash outside of ambulance in normal fashion and location using PPE.
16. Activate bio hazard waste disposal process: Environmental Health Department will be responsible for managed waste disposable of contaminated items.

Any suspicion of exposure during the decontamination process should be reported to the EMS Manager, Medical Director and Infection Control Coordinator immediately for guidance.

Stephen Duval

EMS Manager

Cayman Islands Emergency Medical Services

b) CIEMS Infectious Disease Bulletin

Ebola Virus Disease (EVD)

Purpose:

1. To inform & provide management recommendations to CIEMS Providers about the Ebola Virus Disease (**EVD**).

Background:

1. Patients with **EVD**, also known as Ebola Haemorrhagic Fever, have been confirmed outside the continent of Africa to specially the USA. To militate against this virus we must remain vigilant and knowledgeable.

EVD Transmission:

1. Ebola virus can be transmitted ONLY via DIRECT contact with the bodily fluids (e.g. blood, saliva, emesis, faeces, urine or semen) of a SYMPTOMATIC, INFECTED person.

2. Ebola virus CANNOT be transmitted by casual contact, such as being in the same room with a patient.

3. Persons infected with Ebola virus are ONLY contagious when they are

SYMPTOMATIC. In other words, patients infected with Ebola virus are NOT contagious during the asymptomatic incubation period immediately following infection (which ranges from 2 to 21 days, with an average 8 to 10 days).

Patient Signs and Symptoms of EVD that suggest a patient may be potentially contagious:

1. Fever

2. Headache

3. Malaise

4. Body aches

5. Fatigue

6. Nausea

7. Vomiting

8. Diarrhoea

9. Bleeding or bruising of unknown cause

Patient Evaluation Procedures and Precautions:

1. EMS Providers who evaluate ANY patient with fever **AND** any of the flu-like symptoms listed above shall ALWAYS use STANDARD, DROPLET & CONTACT Precautions.

2. OTHER HISTORY factors associated with risk of exposure for which STANDARD, DROPLET & CONTACT precautions are indicated during patient evaluation/transport:

a. The **ASYMPTOMATIC INCUBATION PERIOD** after exposure to Ebola virus ranges from 2 to 21 days. Therefore, even though the patient may not be symptomatic (or contagious) during this period, any patient who has had contact with a person with EVD should be considered to be at risk.

b. TRAVEL HISTORY: Any patient who has recently travelled to the Democratic Region of Congo should be considered to be at risk.

3. EMS Providers shall follow the CIEMS recommended guidelines for notification of EMS Chain of Command after evaluation and/or transport of a patient with the symptoms listed above.

4. In addition, the HSA **shall be notified** before or during transport of such patients, so that the receiving staff can be notified prior to arrival.

5. Finally, any and all concerns regarding the possibility of EVD shall be communicated directly to the receiving HSA staff immediately upon arrival.

Disinfection and Decontamination Procedures/Precautions:

1. Ebola virus is very fragile. It cannot easily survive outside of body fluids. Therefore, disinfection is relatively simple.

2. Soap and water and standard disinfecting/cleaning solutions readily kill the virus.

3. Standard, Droplet and Contact precautions (including the use of standard personal protective equipment (PPE)), disposal of contaminated items, and equipment cleaning are sufficient to prevent exposure. EMS Providers should follow the CIEMS recommended procedures for routine decontamination of the vehicle and equipment.

4. Procedures with high risk of aerosolization of body fluids (e.g. airway suctioning and advanced airway management) require use of an N95 respirator or higher, and should not be performed during transport of the patient.

Collaborative Approach:

1. The entire HSA family is working collaboratively with the Public Health Department along with our supportive stakeholders in identifying the best practice in mitigating against the Ebola Virus. The EMS Medical Direction Team to provide timely, accurate information to all EMS Providers during this challenging period.

FINAL NOTES:

- **Additional updates will be provided as new information and recommendations become available.**
- **EMS Providers are encouraged to contact EMS Management or the Infectious Disease Coordinator with questions or concerns**

c) **CIEMS Ebola Patient Screening Questioner**

All EMS patients should be screened before transport using the following protocol:

If Ebola is a possibility, notify all additional medical units of pending transport, EMS Management and the HSA online medical control, transport only when directed to.

Does the patient have or have had fever of greater than 101.5° F (38.6° C) and any of the following additional symptoms:

- **Severe headache**
- **Muscle pain**
- **Vomiting**
- **Diarrhoea**
- **Abdominal pain**
- **Unexplained bleeding.**

NO—Transport as normal

YES—Proceed to secondary questions

In the past 3 weeks BEFORE the onset of symptoms has the patient had:

- **Contact with blood or body fluids of a patient known to have or suspected to have Ebola**
- **Residence in, or travel to, a country where an Ebola outbreak is occurring:**
  - **Democratic Region of the Congo, Liberia**
  - **Direct handling of bats or nonhuman primates from disease-endemic areas.**

YES—Consider the patient to possibly have Ebola

NO—Transport as normal

d) **CIEMS Ambulance and Medical Equipment Disinfection & Personnel Decontamination Procedure**

Purpose:

To provide our CIEMS guidance for standardized disinfection procedures for the ambulance and medical equipment, and for basic personnel decontamination procedures used during patient assessment, management and transport.

Background:

Recent events surrounding the confirmed case of Ebola Virus Disease mandate training and Departmental Policy reviews for all EMS personnel in the adherence to standardized disinfection procedures for ambulances and medical equipment, and to personnel medical decontamination procedures. The following procedures are consistent with & derived from the Centers for Disease Control and Prevention's (CDC) current guidelines for disinfection and decontamination.

Definitions:

Disinfection: The act or process of killing or rendering inert pathogenic organisms through a specialized cleansing technique with heat or chemicals. This is specific to biologic agents (bacteria, viruses, fungi, etc.). It is less lethal to pathogenic organisms, as some types (e.g. bacterial spores) may not be killed.

Decontamination: The act or process of removal, inactivation or destruction of foreign material and/or contaminating substances from equipment, vehicles, patients or personnel. This more broadly includes both biologic substances (e.g. blood, body fluids, secretions & excretions) containing pathogenic organisms, as well as other contaminants (e.g. chemicals or radioactive materials). For disease-causing organisms, decontamination renders them incapable of transmitting infectious particles; the decontaminated surface or item is rendered safe for handling, use, or disposal.

Sterilization: A validated process used to render a product free of all forms of living microorganisms. This typically requires steam, high heat, radiation or special chemicals. Sterilization is often expressed as the probability of a microorganism surviving the sterilization process as less than 1 in a million.

Procedures:

1. At the beginning of EVERY shift:

At the beginning of EVERY shift, EMS Providers shall disinfect all of the following:

- All internal surfaces of the ambulance;
- Patient gurney and mattress surfaces;
- All durable medical equipment used (e.g. blood pressure cuff, monitor-defibrillator, stethoscope, glucometer, etc.). Remember: surfaces of monitor-defibrillators, AEDs and other electronic devices should be wiped, not sprayed.

2. ALL patient encounters, with or without transport:

At the completion of ALL patient transports, **and** at the conclusion of the medical encounter with patients who are not transported but who have been evaluated and/or treated in the passenger compartment of the ambulance and/or with EMS equipment, EMS providers shall disinfect ALL of the following:

- Providers' hands and exposed skin (use hand sanitizer or soap and water);
- All internal surfaces of the ambulance;
- Patient gurney and mattress surfaces;
- All durable medical equipment used (e.g. blood pressure cuff, monitor-defibrillator, stethoscope, glucometer, etc.). Remember: surfaces of monitor-defibrillators, AEDs and other electronic devices should be wiped, not sprayed.

3. Visible contamination of the ambulance or equipment:

For visible contamination of the ambulance or equipment with a patient's blood, body fluids, secretions or excretions (e.g. blood, urine, emesis, sputum, or faeces), EMS Providers shall:

- Don appropriate PPE
- Remove all visible body fluids with paper towels or cleaning wipes;
- Place the used cleaning materials into a red bio hazard medical waste container, or a suitably labelled double-bag and maintain it in a secure location until proper disposal is performed.
- Thoroughly disinfect the underlying surface following removal of visible blood, body fluids, secretions and excretions.

4. Visible contamination of an EMS Provider's uniform or clothing:

If an EMS Provider's uniform, turnout gear, or clothing becomes visibly contaminated with any patient's body fluids (e.g. blood, urine, emesis, sputum, or faeces), EMS Providers shall:

- Remove the contaminated clothing;
- Remove any visible contamination from the clothing;
- Place the clothing in a red bio hazard bag or clearly labelled plastic bag;
- Clean underlying skin with soap and water (shower as needed);
- Contact EMS Management for further details regarding uniform and clothing disinfection, and reporting of possible pathogen exposure, per HSA procedures.

Selection of Disinfection & Cleaning Products:

1. The CDC recommends using an EPA-registered hospital disinfectant with label claims for viruses, such as Norovirus or Rotavirus. The CDC's recommendations for disinfecting solutions. These include:

- Zep Spirit II Spray – "Ready to Use"
- Zep Clean'em Spirit II Disinfectant Wipes
- Professional Lysol Brand Disinfectant spray

2. Other disinfectant products may meet the CDC recommendations and are therefore acceptable for use.

3. Regardless of the product, it is ***very important*** to follow all label directions carefully, for maximum effectiveness.

4. NOTE: Bleach can burn human skin, cause corrosion, damage surfaces/electronics, stain clothing, and create toxicity when mixed with other chemicals.

Full-strength household bleach (sodium hypochlorite) should **never** be used on patients or personnel. Its use on durable medical equipment is not preferred.

Dilute bleach solution is an effective disinfectant for equipment and surfaces, but generally **ONLY** as an alternative if other, preferred, agency-specific disinfectants are unavailable. The following dilutions of household bleach may be considered:

a. Bleach solution (1.5 cups of bleach in a gallon of water for a 1:10 dilution): only for grossly contaminated equipment and surfaces.

b. Bleach solution (0.25 cup of bleach in a gallon of water for a 1:100 dilution): for routine disinfection of equipment and surfaces that are not grossly contaminated.

Activate Bio-hazard Waste Disposal:

***Environmental Health Department will be responsible for managed waste disposable of contaminated items.

For ANY questions or concerns about the health or safety related to these

procedures, contact your EMS Manager or Infection Control Coordinator immediately.

VI. QUARANTINE AND ISOLATION

Any suspected (PUI) of EVD should be reported immediately to the Public Health Department at the CIHSA. Any "PUI" or "Probable case" will be reported to CARPHA and subsequently to the CDC in the USA and arrangements will be made for appropriate testing and management.

Any PUI will be quarantined at home or at a location on the CIH compound for 21 days. These persons will be monitored by Public Health personnel (EMS?). If a suspected case becomes symptomatic, an outbreak will be declared. The clinical presentation and level of exposure should be taken into account when determining appropriated public health actions, including the need for medical evaluation or monitoring and the application of movement restrictions when indicated.

a) **Quarantine Unit – Protocols (Nurse Joanna Rose-Wright)**

b) **Isolation Unit Protocols (under preparation by CNO)**

VII. CLINICAL MANAGEMENT GUIDELINES

CASE DETECTION

Case Definition

The classification of cases under this definition relies on clinical, epidemiological, laboratory and high-risk exposure criteria, allowing the identification of persons required to be investigated for EVD and the differentiation of probable and confirmed cases for reporting to the HSA department of public health.

1. Clinical criteria: Fever of greater than 38.6 degrees Celsius or 101.5 degrees Fahrenheit plus other symptoms such as severe headache, muscle pain, vomiting, diarrhoea, abdominal pain, or unexplained haemorrhage; **and**

2. Epidemiological risk factors within the past 21 days before onset of symptoms, such as contact with blood or other body fluids or human remains of a patient known to have or suspected to have EVD; residence in –or travel to- and area where EVD transmission is active; or direct handling of handling of bats and/or non-human primates from disease-endemic areas.

Probable Case

A PUI whose epidemiologic risk factors include high or low risk exposure(s) (see algorithm below)

Confirmed Case

A case with laboratory-confirmed diagnostic evidence of Ebola virus infection

Clinical criteria

Any person currently presenting or having presented with:

- Fever ≥38.6°C or 101.5F

Plus at least one of the following:

- Severe headache
- Muscle pain
- Vomiting, diarrhoea, abdominal pain

- Unexplained haemorrhagic manifestations in various forms
- Multi-organ failure

OR a person who died suddenly and inexplicably

Laboratory criteria

Any of the following:

- Detection of Ebola virus nucleic acid in a clinical specimen and confirmation by sequencing or a second assay on different genomic targets.
- Isolation of Ebola virus from a clinical specimen.

Epidemiological criteria

In the 21 days before the onset of symptoms:

- having been in an affected area;

OR

- having had contact with a probable or confirmed EVD case.

High-risk exposure criteria

Any of the following:

- percutaneous injury (e.g. with needle) or mucosal exposure to blood or bodily fluids, tissues or laboratory specimens of a probable or confirmed case;
- direct skin contact with any material soiled by blood or bodily fluids from a probable or confirmed case;
- processing blood or body fluids of a probable or confirmed case without appropriate personal protective equipment
- close face-to-face contact (e.g. within one metre) without appropriate personal protective equipment (including eye protection) with a probable or confirmed case who

was coughing, vomiting, bleeding, or who had diarrhoea; or had unprotected sexual contact with a case up to three months after recovery;

- direct contact with a dead body, participation in funeral rites with direct exposure to human remains in or from an affected area without appropriate personal protective equipment;
- direct contact with bats, rodents, primates, living or dead, in or from affected areas, or bush meat.

The diagnosis of EVD is based on three components:

Laboratory investigations (see also EVD lab protocol)

Three laboratory tests can be performed on blood samples (blood, serum or plasma) collected in patients suspected of having EVD, depending on the time of sample collection relative to the date of disease onset. Please note however, that only whole blood samples are to be collected. The investigations are:

1) Polymerase chain reaction (PCR). In certain circumstances, this test can be replaced by an antigen detection enzyme-linked immunosorbent assay (ELISA); this test is less sensitive and more broadly cross- reactive
2) IgM during the early convalescence phase of disease (until approximately 8-12 weeks post onset of disease)
3) IgG persists for several months / years after the acute phase of the clinical disease

CLINICAL FEATURES

Patients with EVD usually present with a flu-like syndrome and the clinical signs maybe categorized as early or late (these often overlap) as highlighted below.

Early clinical features of Ebola

- Sudden onset of fever (38.6˚C)
- Intense tiredness
- Weakness
- Malaise
- Headache
- Arthralgia
- Abdominal pain
- Conjunctivitis
- Myalgia
- Throat pain
- Diarrhoea (with or without blood)
- Anorexia
- Hiccups

Late clinical features of Ebola

- Confusion and irritability
- Seizures
- Vomiting (sometimes bloody)
- Diarrhoea (watery or bloody)
- Skin rash
- Internal and external bleeding (Haemoptysis, Haematemesis Ecchymoses, Petechiae Haematuria, Epistaxis)
- Miscarriage in pregnant woman
- Shock
- Respiratory distress
- Chest pain

MANAGEMENT OF CONFIRMED CASES

If EVD is suspected the clinician must:

Isolate the patient

(The patient must be quickly triaged to the prepared isolation facility / holding area)

Notify the Public Health Department.

EVD is a Class 1 Notifiable Disease and must be reported **immediately** on suspicion to the:

- Medical Officer of Health (MOH) at 925 9815
- The Head of Department, GP (HoDGP) 938 1331

Educate the patient and family

a. Inform of the reasons for the isolation / holding.
b. Advise of the procedures to be followed regarding the control of transmission to the family, health workers and the community.
c. Instruct the patient about respiratory hygiene and the proper use of a surgical mask that is to be provided for the patient.

Manage the patient

The clinical management of EVD is mainly supportive and should focus on early recognition of the disease being mindful that haemorrhage occurs in less than half the number of patients confirmed for Ebola. Bleeding when present is usually noted in the later stages of the illness. The management of pain and anxiety are particularly important and in addition to careful monitoring, patients will require psychological support.

History

- Obtain a travel history, particularly to affected areas
- Obtain a history of contact with persons visiting or who have travelled to an affected area

- Ascertain if there has been any contact with someone in the last three (3) weeks who was ill with fever, with or without bleeding or who died from an unexplained illness with fever plus or minus bleeding
- Determine if there has been any exposure to body fluids (humans / animals) dead or alive

Hospitalization

Suspected cases of EVD MUST be hospitalized in isolation for clinical monitoring, appropriate diagnostic investigation and supportive care.

Direct Patient Care

- All standard infection control protocols should be adhered to and personal protective equipment (PPE) (suits, surgical masks, goggles – preferably with anti-fog visor, waterproof apron, gloves and closed shoes must be worn prior to examining the patient(s)
- All suspected or confirmed cases are to be placed in a single isolation room with an adjoining dedicated toilet, shower, sink equipped with running water, soap and single-use towels, alcohol-based hand sanitizer dispensers, stocks of PPE, stocks of medicines, good ventilation, screened windows and doors closed
- If single rooms are unavailable, patients with EVD can be cohorted in a specific well defined confined area that is clearly segregated from other patient care areas
- The beds should be placed at least 1 meter (3 feet) apart
- Each patient should have exclusively dedicated injection and parenteral medication equipment which should be disposed of at the point of care
- Syringes, needles or similar equipment should never be reused
- The use of needles and other sharp objects should be limited. Phlebotomy and laboratory testing should only be for essential diagnostic evaluation
- If sharps are used, ensure that:

- caps are never replaced
- used needles should never be stuck in the bed, placed on the floor/trolley
- the needle is never pointed towards the body
- needles are not removed from disposable syringes by hand
- used needles are not bent, broken or otherwise manipulated by hand
- syringes, needles, scalpel blades and other sharp objects are disposed of in a puncture resistant container at the point of care
- sharps are never to be carried in hand but in a tray / kidney dish if sharps container is not by the bedside

- The number of staff dedicated to the care of the patient must be restricted
- The number of visits to the patient must be limited
- A log must be kept of all staff caring for the patient
- All PPEs must be removed before leaving the isolation area
- Special care should be taken when removing PPE to prevent contact with eyes and mucous membranes
- Dedicated staff must be assigned to monitor the correct use of PPEs

Investigations

Taking samples from patients suspected of having EVD carry a heightened level of risk and proper protective equipment along with universal precautions cannot be overstated.

- The MOH or HoDGP should be immediately contacted at 9259815 or 938 1331 once EVD is suspected and await further instructions regarding collection of the sample
- The HSA laboratory must be notified before samples are dispatched (*see also EVD laboratory protocol*)

- Acute phase whole blood should be taken from the patient within seven days of onset of symptoms
- A minimum five millilitres of whole blood should be placed in a plastic collection tube (Purple top) that contains ethylene diamine tetraacetic acid (EDTA). This will be delivered to the lab as per the EVD lab protocol.
- Specimens must be appropriately labelled and accompanied with complete documentation.
- Additional blood tests will be done as point of care tests as per the EVD lab protocol.
- Invasive procedures should be limited for confirmed and suspected cases of EVD

Interpretation of Results

	Lab confirmation of:	*Results*
1.	Acute Infection	PCR and/or IgM positive
2.	Recent infection (within previous couple of months, i.e. in current outbreak)	IgM and IgG positive
3.	Older infection (within the last couple of years)	High IgG positive only (no IgM)
4.	Past infection (not associated with current outbreak)	Lower IgG positive only (no IgM)

Treatment

There is no specific licensed therapy for the treatment of EVD. Some experimental treatments developed for Ebola have been tested and proven effective in animals but have not yet been tested in randomized trials in humans. The treatment of EVD is mainly supportive and should begin immediately (prior to confirmation of the virus). It should be directed at maintaining renal function, electrolyte balance and at combating haemorrhage and shock. Recovery from Ebola depends on the patient's immune response. People who recover from Ebola infection develop antibodies that last for at least ten years, possibly longer.

Table 1 highlights the management of some specific signs/symptoms of EVD.

TABLE 1: SYMPTOMATIC TREATMENT OF EVD

Symptoms/Signs	**Treatment**
Fever (>38.6 °C)	Manage fever with paracetamol avoid diclofenac, ibuprofen, aspirin and other NSAIDs.
Pain	Treat pain with paracetamol (if mild) or morphine (if moderate to severe). Avoid aspirin, diclofenac, ibuprofen and other NSAIDs
Diarrhoea, vomiting, signs of dehydration Moderate to severe dehydration	Provide oral rehydration salt (ORS) even if there is no sign of dehydration. Monitor for dehydration Anti-emetic medications may offer some relief and facilitate oral rehydration • For adult, give chlorpromazine 25-50 mg, four times daily IM or metoclopramide 10 mg IV/ orally three times daily until vomiting stops • For children, give promethazine (Monitor for extrapyramidal signs) Treat as per protocol for adult and child with intravenous fluids
Difficulty breathing / respiratory distress	Oxygen: titrate to Sp02 ≥90% • If SpO2 < 90% o start adult on 5 litres/minute (nasal prongs) o start child at 1-2 litres/minute (nasal prongs) Evaluate for pneumonia, wheezing, fluid overload, and congestive heart failure - manage as per standard protocol for these conditions
Acute significant bleeding with signs of circulatory	Transfuse with whole blood

Symptoms/Signs	Treatment
shock	
Anxiety	Give psychological support Consider Diazepam for adults: 5-15 mg/day in 3 divided doses
Convulsions	Give Diazepam (oral, rectal or intravenous) to abort seizure if prolonged; then control with Phenobarbital loading dose (child; 15mg/kg over 15 minutes IM/IV) adult: 10mg/kg
Confusion in cooperative patient	Reason with patient, allay fear Consider Diazepam 5 mg at night (adult)
Confusion and aggression in non-cooperative patient	Sedate with Haloperidol 5 mg IM (adult)

Management of Contacts

Definitions

A close (high risk) contact requiring Public Health follow-up is defined as an individual who has:

- provided care to the patient (including a health care worker, family member, funeral worker, or volunteer),

OR

- had other close physical contact with the patient or deceased body, that may have resulted in unprotected exposure to blood or body fluids from the patient directly or indirectly through contaminated surfaces or equipment

OR

- worked in a laboratory handling specimens from EVD patients and may have had unprotected exposure to these specimens through the course of their work.

Contacts of patients with EVD should be under surveillance or quarantined for 21 days post exposure, as determined by the Public Health team.

Health Care Worker Exposure

- HCWs with percutaneous or muco-cutaneous exposure to blood, body fluids, secretions, or excretions from a patient with suspected or confirmed EVD should immediately and safely stop any current tasks, leave the patient care area, and safely remove PPE according to protocol
- Immediately after leaving the patient care area, wash the affected skin surfaces or the percutaneous injury site with soap and water. Accordingly, irrigate mucous membranes (e.g. conjunctiva) with copious amounts of water but not with chlorine solution
- Report the incident immediately
- Exposed persons should be medically evaluated and this should include screening for HIV, and HCV
- Exposed workers should be quarantined and receive follow-up care, including fever monitoring, twice daily for 21 days after the incident
- If the HCW is suspected of being infected the recommendations for care and isolation should be followed as stated above

IMMEDIATE POST EXPOSURE

If exposed:

- Individuals including health workers with percutaneous or mucocutaneous exposure to blood, body fluids, secretions, or excretions from a patient with suspected EVD should immediately wash the affected skin surfaces with soap and water. Mucous membranes (e.g. conjunctiva) should be irrigated with copious amounts of water

Exposed persons should:

- be quarantined

- be medically evaluated
- receive follow-up care, including fever monitoring, twice daily for 21 days after exposure
    - The incubation period between exposure and clinical symptoms is a minimum of 48 hours
- be admitted and isolated if their body temperature rises above 38.6°C

have contact tracing and follow-up of family, friends, co-workers, and other patients who may have been exposed to the Ebola virus through close association with them.

SPECIAL CONSIDERATIONS – Lactating women

- Ebola virus is transmitted in breast milk but the period of infectiousness in breast milk is unknown
- Mothers suspected of EVD must stop breast feeding
- Breast congestion must be managed; mothers if capable must express the milk, if not, healthcare staff should express same once properly attired in PPEs
    - The milk should be discarded in the toilet
- Exposed infants must be admitted and isolated

SPECIAL CONSIDERATIONS – Men

Men continue to shed the virus in the semen up to seven weeks after symptoms have resolved and must be advised to use a condom or abstain from sexual intercourse during this period.

SPECIAL CONSIDERATIONS – Children

- HCWs should monitor closely for:
    - dehydration / hypovolemic shock
    - septic shock

    - fluid overload
- If both mother and child have been exposed and test positive, the child can be returned to the mother and they be cared for together
- If the child has a negative result, then two additional blood tests, two days apart must be done and be also negative in order for the child to leave the paediatric isolation facility (this child must be treated as a high-risk contact).

DISCHARGE

All discharges should be discussed with and agreed upon by the Medical Officer of Health. Persons Under Investigation (PUI) cases are discharged when they:

- have not met the case definition of a suspected case
- do not have an epidemiological link to any suspected or confirmed case
- have responded to specific treatment
- are considered to be in good health and able to go back home

Discharge of a confirmed or suspected case is based on the clinical presentation and laboratory findings. Discharge may be considered when:

- they have had three or more days without fever or any significant symptoms
- symptoms that suggest ongoing shedding of the virus (e.g. diarrhoea, coughing, bleeding) have completely disappeared
    - viral shedding in semen and breast milk does not preclude discharge but counselling must be done prior to departure
- patients have significantly improved and can independently carry out routine daily activities (wash, eat, walk) without assistance taking into account previous disabilities
- there is a negative blood PCR on day three or later following onset of symptoms
    - For patients with a previous positive PCR, this means a subsequent negative test at least 48 hours from the initial test

FOLLOW UP

- Patients that were admitted but turned out not to be cases must be followed to ensure that other health care needs are met (other healthcare professionals must be encouraged to treat these patients)
- These patients may be stigmatized and the community will need medical assurance before accepting them

Supportive treatment for all discharged patients includes:

- the provision of one-month supply of vitamin supplements
- nutritional counselling where they are advised to eat high-energy foods that can be easily digested, rich in complex carbohydrates and balanced in fat, protein and fibre
- the provision of condoms with instructions on use and the minimum length of time that they should be used
- advising women who are breastfeeding to stop breastfeeding
    - Infant should be fed with formula appropriate for the infant's age
    - Counselling and support should be provided for the mother

The healthcare team must anticipate that the patients' relatives and the community may reject them; so, the necessary counselling should be provided to ensure that they understand that the patient is no longer a danger.

MENTAL HEALTH INTERVENTIONS

- Develop contingency plans for the management of psychotic, difficult to control, and contagious patients (e.g. reserve a separate isolation room for such patients
- Manage urgent psychiatric and neurological complaints (e.g. psychoses, severe depression) as soon as possible. Ensure availability of essential psychotropic medication

- As far as possible, manage acute distress without medication: listen; convey compassion; assess needs; ensure basic needs are met; provide or mobilize company, preferably from family or close friends; encourage but do not force social support; protect from further harm.

VIII. CONTACT TRACING

In principle, contact tracing is broken down into three basic elements, namely, contact identification, contact listing and contact follow-up. The three elements of contact tracing are described below.

Contact identification

Contact identification is an essential part of epidemiologic investigation for all cases meeting the standard/surveillance case definitions of EVD. These cases are classified as Person under Investigation (suspected), probable, or confirmed. Epidemiologic investigation is also conducted for all deaths, either in the community or in a health facility that are attributable to EVD. The process of verifying the cause of death is called verbal autopsy, which aims to establish the likely cause of death and identify chains of transmission. The tool for conducting an epidemiologic investigation is the case investigation form. The use of a comprehensive and standardized case investigation form is recommended. The epidemiologist/surveillance officer conducting the epidemiologic investigation should complete case investigation forms for all the EVD cases and deaths meeting the standard/surveillance case definition.

After completing the case investigation form, the epidemiologist/surveillance officer should systematically identify potential contacts. Contact identification therefore begins from a case**.**

Identification of contacts is done by asking about the activities of the case (whether alive or dead) and the activities and roles of the people around the case (alive/dead) since onset of illness. Although some information can be obtained from the patient, much of the information will come from the people around the patient. It is mandatory for the epidemiologist/surveillance officer to visit the home of the patient. The following information should be obtained:

a. All persons who lived with the case (alive/dead) in the same households since onset of illness.
b. All persons who visited the patient (alive/dead) either at home or in the health facility since onset of illness.
c. All places and persons visited by the patient since onset of illness e.g. traditional healer, church, relatives, etc. All these places and persons should be visited and contacts identified.

d. All health facilities visited by the patient since onset of illness and all health workers who attended to the patient (alive/dead) without appropriate infection prevention and control procedures.
e. All persons who had contact with the dead body from the time of death, through the preparation of the body and the burial ceremonies.
f. During the home visit, the contact tracing/follow-up teams should ask about persons who might have been exposed to the patient (alive/dead) but were not identified and listed as contacts through the above process.

Priority should be given to these **high risk categories of contacts**, persons who within the last 21 days:

a. Touched the patient's body fluids (blood, vomit, saliva, urine, faeces).
b. Had direct physical contact with the body of the patient (alive/dead).
c. Touched or cleaned the linens or clothes of the patient.
d. Slept or ate in the same household as the patient.
e. Have been breastfed by the patient (i.e. babies).
f. Health care workers who suffered a needle-stick injury from a contaminated instrument while attending to a probable or confirmed EVD patient.
g. Laboratory workers who had direct contact with specimens collected from suspected
h. Ebola patients without appropriate infection prevention and control measures.
i. Patients who received care in a hospital where EVD patients were treated before the initiation of strict isolation and infection prevention and control measures (hospital acquired infection – the circumstance of exposure should be critically examined).

The exposure information should be verified and double-checked for consistency and completeness during re-interview in later visits to ensure that all chains of transmission are identified and monitored for timely containment of the outbreak.

Contact listing

All persons considered to have had significant exposure (falling in the categories described above) should be listed as contacts, using the **contact listing form** [Annex]. Efforts should be made to physically identify every listed contact and inform them of their contact status, what it means, the actions that will follow, and the importance of receiving early care if they develop symptoms. The

contact should also be provided with preventive information [Annex] to reduce the risk of exposing people close to them.

The process of informing contacts of their status should be done with tact and empathy, since being a contact can be associated with serious health outcomes. Avoid using alarming information, such as 'Ebola has no treatment' or 'Ebola has a very high case fatality rate'.

Advise all contacts to:

a. Remain at home as much as possible and restrict close contact with other people.
b. Avoid crowded places, social gatherings, and the use of public transport.
c. Report any suspicious signs and symptoms such as fever, headache, and weakness **immediately** (provide telephone numbers for the contact follow-up team, the supervisor or the Ebola hotline/call centre numbers). Explain that getting early and good clinical care improves health outcomes, and immediate evacuation from the home and isolation reduces the risk of infecting family members.

In addition, provide information on:

- EVD preventive measures through inter-personal communication and where applicable, provide materials like leaflets and brochures.
- Preventive measures to mitigate the risk of exposing family members and others if a contact develops symptoms.
- Guidance for home-based care at onset of illness while waiting for evacuation and isolation.

Contact identification and listing, including the process of informing contacts of their status, should be done by the epidemiologist or surveillance officer, not by the local surveillance staff/community health worker performing the daily follow-up. The local surveillance staff/community health worker should be introduced during the initial home visit as the person who will conduct home visits.

Contact follow-up

The epidemiologist/surveillance officer responsible for contact tracing should assemble a competent team comprising local surveillance and appropriate community members to follow up all the listed contacts. This could include surveillance staff/health workers from health facilities, community health workers, volunteers e.g. from the Red Cross and community leaders.

An efficient contact tracing system depends on a relationship of trust with the community, which in turn fosters optimum cooperation. Communities should have the confidence to cooperate with contact tracing teams and allow the referral of symptomatic contacts to designated isolation facilities. Involving appropriate community members (in particular local leaders) in contact tracing is critical in cultivating this good relationship, trust and confidence.

The local surveillance and community volunteers should be involved as early as possible in the response. The local surveillance staff and community health workers should be closely supervised by trained epidemiologists/surveillance officers.

The contact follow-up teams and their supervisors should be trained in a one-day workshop to familiarize the team with basic information on EVD, procedures and tools for contact tracing, and the required safety precautions. The training package should cover:

- Basic facts about EVD, transmission, and preventive measures.
- The rationale and procedures for contact tracing/follow-up.
- Contact tracing/follow-up tools, temperature monitoring, reporting, etc.
- Recommended infection prevention and control measures for contact tracing teams.
- Home-based preventive measures at onset of illness.
- Home-based care for symptomatic contacts/EVD cases.
- Linkage/coordination with other response groups.

After the orientation, the contact follow-up teams should be equipped with all the necessary tools, including:

- Contact listing, contact follow-up, reporting and monitoring forms.
- Pens.
- Thermometers (preferably digital).
- Alcohol-based hand rub solutions.
- Ebola fact sheets and posters.
- Protocol for reducing risks of transmission at home [Annex].
- Guidelines for home-based care for symptomatic contacts/EVD cases [Annex].
- Important contact list (e.g. technical leads, supervisors, call centre, ambulance, etc.).

- Disposable gloves.
- Mobile phones with sufficient credit or other devices for supervisors.

Procedures for conducting contact follow-up

The steps below provide guidance on contact follow-up:

1. Each morning, the epidemiologist/surveillance officer responsible for contact tracing prepares the list of contacts to be followed that day using an appropriate application (e.g. FIMS, Epi-info or manually).
2. The epidemiologist provides the list of contacts to the supervisors in a meeting, taking into account the supervisors' route, the number of contacts in a particular area, and the local administrative setting.
3. The supervisors travel to their areas of work and meet the contact follow-up teams at a central meeting point e.g. nearby health facility, school, church, etc., and the teams are assigned the contacts to visit.
4. After receiving the lists of contacts, the teams go to their respective communities for home visits.
5. The team should observe the culturally recommended practice of greeting, except for those that entail direct physical contact like shaking hands or hugging. Explain to the household that the restrictions have been recommended to contain the spread of EVD.
6. If offered seats, inform the household that you will not stay long and need to quickly interview the contacts so that the team sees the other contacts before the day ends.
7. Interview and assess the contact for symptoms using the contact follow-up form. and take their body temperature. Do not take their temperature if they have symptoms.
8. If a contact is not at home, the team should inform the supervisor immediately while trying to establish the contact's location. The role of the community leader becomes critical in such incidents. A satisfactory explanation should be obtained for a contact's absence.
9. After finishing the interview/assessment, ask whether any other person in the house is not feeling well (even if the person is not a contact). This serves to identify any sick person in the community, a process referred to as active case search.

10. The contact follow-up team prepares a report summarizing the findings using the reporting format.
11. After completing the assigned home visits, the teams should assemble in the central meeting point to provide feedback to the supervisor.
12. The supervisor collects all the reports of contacts followed up that day and prepares a summary report for the epidemiologist/surveillance officer. The report should include any other issues encountered during the home visit.
13. The epidemiologist makes a consolidated report of all contact tracing, which forms part of the surveillance sub-committee report presented to the taskforce.

Managing contacts with signs and symptoms

The contact tracing/follow-up team is usually the first to know when a contact has developed symptoms. This may be volunteered by the contact in a phone call, or the contact tracing team makes the discovery during a home visit. The contact follow-up team **must not** take the temperature of contacts with symptoms. If a contact develops signs and symptoms, the responsible team should immediately notify the supervisor and/or the alert management desk/call centre. The alert management desk/call centre will complete the Ebola alert case notification form [Annex] and immediately inform the case management team leader. The ambulance team is then dispatched to conduct an assessment and/or evacuation of the symptomatic contact to the treatment centre.

Supervision of contact follow-up

Close supervision and monitoring of contact follow-up is necessary to ensure that the local surveillance/community workers visit and observe contacts daily. Supervisors should join contact follow-up teams for home visits on a rotating basis to ensure that home visits are done correctly. Quality checks may also include randomly calling some contacts to verify whether they were visited. Conduct regular meetings with all contact tracing teams to address any issues that might have an impact on the effective functioning of contact tracing. Other administrative strategies may be needed to address non-compliance and the management of uncooperative contacts.

Discharge of contacts

Contact identification, listing and follow-up should start as soon as a suspected case or death has been identified. However, follow-up of contacts for suspect cases that test negative for EVD should stop and the contacts removed from the contact list.

Contacts completing the 21-day follow-up period should be assessed on the last day. In the absence of any symptoms, the contacts should be informed that they have been discharged from follow-up and can resume normal activities and social interactions. The team should spend time with the contacts' neighbors and close associates to assure them that the discharged contacts no longer poses a risk of transmitting the disease. If an employer requests an official letter declaring the end of follow-up, this could be provided by the response team.

The contacts should ensure that they are not re-exposed to symptomatic contacts or probable/confirmed cases of Ebola.

Recommended safety precautions for contact tracing teams

Since EVD cases are more likely to be discovered during contact follow-up, contact-tracing teams should take precautionary measures to protect themselves during home visits.

The teams MUST abide by the following:

1. Avoid direct physical contact like shaking hands or hugging.
2. Maintain a comfortable distance (more than 1metre)) from the person.
3. Avoid entering the residence.
4. Avoid sitting on chairs offered to you.
5. Avoid touching or leaning against potentially contaminated objects.
6. Always have a good breakfast before home visits to resist the temptation of eating or drinking while visiting contacts.
7. Do not conduct home visits wearing personal protective equipment like masks, gloves, or gowns.
8. If you must take the contact's temperature:
    a. Put on disposable gloves.
    b. Have the contact turn around and take their temperature in the armpit.
    c. Avoid touching the patient and step back to wait for the thermometer.
9. If the contact is visibly ill, do not attempt to take their temperature, but notify your supervisor.
10. As part of the overall safety of the response team, all members of the contact tracing team should monitor their own temperature every morning.

CONTACT DATABASE

With increasing number of EVD cases, the effective management of contacts requires appropriate software applications designed to manage cases and their corresponding contacts (although this may not be required in Cayman beyond our standard approaches).

These applications, FIMS and Epi-info, have been developed to streamline management of contacts during infectious disease outbreaks. The applications support the following aspects of case and contact data management:

a. Registration of cases and case-related data.
b. Registration of contacts and contact-related data.
c. Production of daily follow-up reports.
d. Production of predefined situation reports.
e. Exporting data in different formats (txt, xls, xml etc.) for further analysis.
f. Summary case and contact mapping (using GIS software).
g. Visualization of chains of transmission.

During an outbreak, WHO or collaborating partners will deploy a data manager to train national epidemiologists and data managers and establish outbreak case-contact databases. This is a quick way of building local capacity to use the software to support field operations. The national authority, in collaboration with WHO, should then organize formal training for national outbreak response teams including data managers, biostatisticians, epidemiologists, and other public health professionals after the outbreak is controlled. For areas at-risk of EVD spread, training field teams should be prioritized to enhance EVD outbreak readiness and response capacity.

(Relevant forms to be modified from CDC format)

Estimating resource requirements for contact tracing

Setting up a functional system for contact tracing requires significant human, financial and logistical resources. The suggestions below provide a basis for estimating the resources needed for contact tracing. The epidemiologist/surveillance officer responsible for contact tracing, in collaboration with the national/sub-national emergency management committee, should determine:

a. The average number of contacts to be visited per day by one contact follow-up team (comprising 1 surveillance staff and 1 community volunteer) e.g. 10 contacts per day.
b. The remuneration for each member of the team per day if applicable.
c. The number of contact follow-up teams to be supervised by one trained supervisor e.g. one supervisor is responsible for an average of 15 teams.
d. The allowance of the supervisor if applicable.
e. The supervisor will require transport, either a motorcycle for one supervisor or a vehicle for 5 supervisors working along the same route.

IX. EVD LABORATORY PROTOCOL

0 INTRODUCTIONS

Ebola viral disease (EVD) is one of numerous viral hemorrhagic fevers (VHF). It is a severe, often fatal disease in human and nonhuman primates. Ebola virus is spread by direct contact with the blood or body fluids (such as urine, saliva, feces, vomit and semen) of an infected person or by being exposed to objects that have been contaminated with infected blood or body fluids. The incubation period is usually 8–10 days (rarely ranging from 2 to 21 days). Patients can transmit the virus once symptoms appear and through the later stages of disease, as well as post-mortem.

Ebola has an apparent low infectious dose, the potential of high virus titers in the blood of ill patients, and can result in severe disease. Therefore, it is essential that laboratorians, supervisors, and other workers review laboratory safety procedures and guidelines to make sure to follow these biosafety recommendations

0.1 Purpose and scope

The purpose of this document is to provide guidelines to all stakeholders with respect to the handling of suspected/potential EVD cases. It provides the necessary guidelines with respect to communication (between all stakeholders), appropriate Personal Protective Equipment, sample management, which includes, but not limited to collection/timing, transportation.

0.2 Responsibilities

All Laboratory staff.

0.3 References

http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-specimen-collection-submission patients-suspected-infection-ebola.html

http://safespec.dupont.com/safespec/media/documents/Tychem_user_manual.pdf

0.4 Communication

In the event of a suspected case of EVD, the attending Physician/Medical personnel (to include Public Health officials) should contact the lab with information regarding the patient, which must be clearly communicated to the Laboratory Manager, and the Laboratory staff on duty. This information should include but not limited to the Patient's name, Medical Record Number (MRN), location, Presumptive diagnosis and signs and symptoms at time of admission.

1 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE for the handling of suspected EVD cases will include

- Plastic liquid resistant/impermeable aprons
- Latex Gloves (Double gloving must be employed)
- Tychem QC coveralls with attached hood and boots
- 3M Full faceshield/Respirator
- Outer Latex overboots

2 PRIMARY SAMPLE

A minimum volume of 4mL whole blood in **PLASTIC** collection tubes can be used to submit specimens for testing for Ebola virus. **Do not submit** specimens to CDC in glass containers or in heparinized tubes.

Whole blood preserved with EDTA is preferred but whole blood preserved with; sodium polyanethol sulfonate (SPS), citrate, or with clot activator is acceptable.

It is not necessary to separate and remove serum or plasma from the primary collection container. Specimens should be immediately stored or transported at 2-8°C or frozen on cold-packs to the CDC

2.1 Specimen collection and preparation

NB. Phlebotomy, procedures, and laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and medical care.

EVD Teams

For work with EVD cases, two lab staff will be required to be a part of the sample collection/transport team. One individual will have direct contact with the patient or sample, and the second individual the designated "disinfector", will also be the lead tech. At no point will the lead tech enter the quarantined area or have any type of contact with the patient.

After contact with an infected patient, the protective suit must be disinfected with 10% Sodium Hypochlorite (bleach) solution before being removed, so after sample collection, as the "disinfector", the lead tech has the task of decontaminating the other colleague. Both individuals are required to wear Aprons, Coveralls, Full face shields/Respirators, and double gloves, as described in the PPE section.

The lead tech will also be responsible for instructing, observing and assisting with the removal of their colleagues PPE. PPE shall be discarded in a biohazard bag (x2) and autoclaved immediately.

Steps to put on PPE **

The following information about proper PPE during an EVD outbreak targets the front line-clinical provider and represents the minimum guidance to achieve appropriate protection for infection prevention and control

1. Always put on essential required PPE when handling a suspect, probable or confirmed case of EVD. Gather all necessary items of the PPE beforehand
2. The dressing and undressing of PPE should be assisted/supervised by the team lead. These instructions should be readily available during the dressing/undressing process
3. Put on the Tychem coveralls
    a. Conduct a visual inspection of the garment before you begin donning

       :- garment must be free of discoloration, alterations or physical damage

    b. Remove all jewellery and personal items (pens, key rings, badges, pagers, knife

       cases, etc.) that might damage the garment.

    c. Check function of face piece / respirator and place nearby donning location.
    d. Open the garment closure completely.
    e. Remove your shoes. If the garment has attached socks, these socks are worn inside outer chemical (latex) over boots. These socks do not have adequate durability or slip resistance to be worn as the outer footwear covering.
    f. While sitting, insert your feet into the garment legs and down into socks. Stretch your legs out to maximum extension while pulling garment up around hips.
    g. Put on latex over boots
    h. Place one hand in the sleeve and pull the garment sleeve to your shoulder.
    i. Place your other hand in the sleeve, and pull the garment over that shoulder
    j. Don the gloves (first pair) . Pull the sleeves of the garment over the gauntlet of the gloves.

    k. Apply a second pair of gloves; pull the gauntlet of this pair of gloves over the cuff of the garment. Do not rely upon taping to provide a liquid - tight seal. Only use tape to hold the glove in position over the cuff of the sleeve.
    l. Put on the face shield / respirator

Donning and User Seal Check

a. Fully loosen all four head straps, place facepiece on face and pull head harness to back of head. (Fig. 6)

b. Pull the ends of the four straps to adjust tightness, starting with the neck straps first, then the forehead straps. Do not over tighten the straps (Fig. 7).

c. Perform a positive and/or negative pressure user seal check each time the respirator is donned.

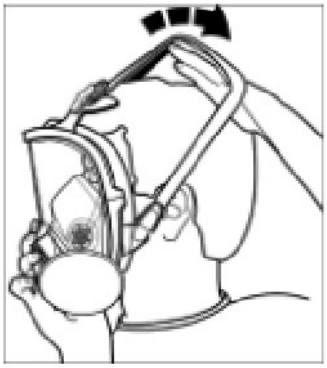


Fig. 6

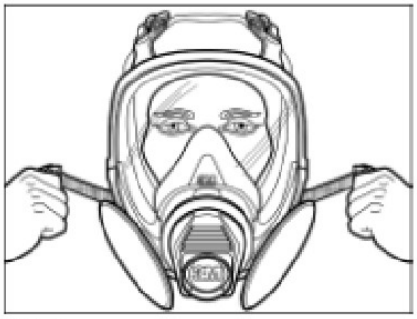


Fig. 7

POSITIVE AND NEGATIVE PRESSURE USER SEAL CHECKS

Always check the seal of the respirator on your face before entering a contaminated area.

Positive Pressure Seal Check

a. Place the palm of your hand over the exhalation valve cover and exhale gently. If facepiece bulges slightly and no air leaks are detected between your face and the facepiece, a proper seal has been obtained (Fig. 8).

b. If face-seal air leakage is detected, reposition respirator on your face and/or readjust tension of the straps to eliminate leakage.

Fig. 8

If you cannot achieve a proper seal, **DO NOT** enter the contaminated area. See your supervisor.

Negative Pressure Seal Check for 2000 Series Filters

a. Place your thumbs onto the centre portion of the filters, restricting airflow through filters and inhale gently. If you feel facepiece collapse slightly and pull closer to your face with no leaks between the face and facepiece, a proper seal has been obtained (Fig. 10).

Fig. 10

b. If face-seal air leakage is detected, reposition respirator on face and/or readjust tension of straps to eliminate the leakage.

For an instructional video on how to use the 3m 6000 respirator, follow the link below

http://www.youtube.com/watch?v=PQ8t7XYGhQ4

m. Place the attached hood, over your head. Ensure that the hood is securely fitted around the face - piece of the respirator.

n. Close the garment zipper. After checking that the zipper is completely closed, fold and secure the flaps over the closure

4. Put on plastic apron

5. If necessary, use tape to ensure that any exposed area, is fully secured.

For an instructional video on donning PPE follow the link below

http://www.youtube.com/watch?v=K1cHw4lUhtQ

Steps to remove PPE **

1. Personnel who enter the quarantine area, or come into contact with the suspected EVD patient must first have their PPE decontaminated by the lead tech, before any removal is attempted.

2. After decontamination remove the plastic apron

3. The coverall will then be removed*

   a. After field decontamination, if the garment has been contaminated or is suspected of being contaminated, continue to use your respirator until the garment has been doffed and removed.

   b. Have the assistant remove the outer (second pair) of gloves by grasping the finger tips, and pulling them off.

   c. While you stand, have your assistant partially open the closure of your garment, pull down the hood, open the closure completely and peel the garment down and away from your shoulders. Have the assistant help you remove your arms from the sleeves.

   d. Have your assistant lower the garment below your the hips without touching the inside of the garment.

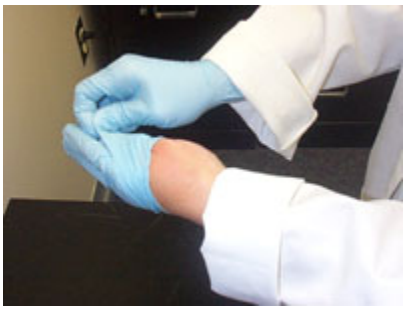
   e. While sitting, have your assistant help you remove your boots, pull the garment off your legs and take the garment away.

4. The face-shield /respirator will be removed next, and placed in a specially designated receptacle/container for decontamination.

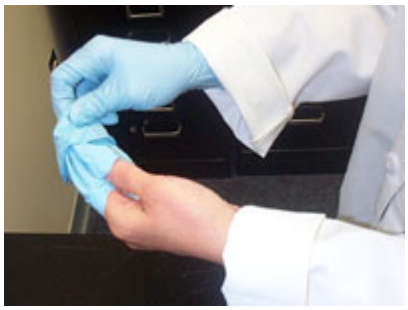
5. The (inner) gloves will be removed next

Follow these steps to remove gloves and avoid self-contamination:

Pull one glove near your wrist towards your finger tips until the glove folds over.



Carefully grasp the fold and pull towards your finger tips. As you pull you are turning the inside of the glove outwards.



Pull the fold until the glove is almost off

To avoid contamination of your environment, continue to hold the removed glove. Completely remove your hand from the glove.

Slide a finger from your glove free hand under the remaining glove. Continue to slide your finger towards your finger tips until almost half of your finger is under the glove.

Turn you finger 180 degrees and pull the glove outwards and towards your finger tips. As you do this, the first glove will be encased in the second glove. The inside of the second glove will also be turned outwards.

Grab the gloves firmly, by the uncontaminated surface (the side that was originally touching your hand). Release your grasp of the first glove you removed. Pull your second hand free from its glove. Dispose of the gloves in the designated biohazard waste container.

6. Perform hand hygiene/washing

7. The lead tech will then decontaminate their (gloved) hands in a container with 10% bleach solution, and then remove their own PPE in the same order as above, and perform hand hygiene/washing.

For an instructional video on doffing PPE, follow the link below:

http://www.youtube.com/watch?v=MlZy4YfVTAk

** Procedure to be finalized once actual PPE is received in lab.*

*** Site for donning, and doffing PPE to be determined*

Sample collection

Only essential equipment should be taken into the patient room. Medical devices and equipment should be disposable. In the event non-disposable equipment is used, these should be dedicated to the patient until the diagnosis of EVD is excluded, the patient is discharged or the precautions are discontinued. All re-usable, noncritical equipment must be cleaned and disinfected using 10% Sodium Hypochlorite solution and according to the manufacturer's instructions prior to re-use on a subsequent patient. Semi critical and critical equipment should be cleaned and high-level disinfected or sterilized/decontaminated using standard procedures, as well as manufacturer's guidelines.

Use of needles and sharps should be kept to a minimum and used for medically essential procedures only. Safety-engineered medical devices **must** be used. Extreme care should be used when handling all sharps. A puncture resistant sharps container must be available at point-of-use.

Step 1 – Assemble equipment

It is advisable that a specific phlebotomy tray and tube rack be used when dealing with cases of EVD. The choice of this tray will be decided upon based on factors such as ease of decontamination, and disposal.

Collect all the equipment needed for the procedure and place it within safe and easy reach on the tray, ensuring that all the items are clearly visible. The equipment required includes:

- A supply of laboratory sample tubes, which should be stored dry and upright in a rack
- Blood shall be collected in
    - sterile plastic tubes (vacutainer brand) with rubber caps (the choice of tube will depend on what test is ordered, and the sampling requirements);
- An assortment of blood-sampling devices (safety-engineered devices or needles) of different sizes
- Disposable tourniquet
- 70% alcohol swabs for skin disinfection;
- Gauze or cotton-wool ball to be applied over puncture site;
- Laboratory specimen labels;
- Writing equipment;

- Leak-proof biohazard transportation bags (with absorbent material);
- A puncture-resistant sharps container.
- Squeeze bottle with freshly prepared (every day) 10% Sodium Hypochlorite solution for decontamination.

Step 2 – Phlebotomy

Perform phlebotomy on patient as per SOP, ensuring at all times to adhere to Standard Safety Precautions

Step 3 - Prepare samples for transportation to lab

Using a piece of gauze, dampened with 10% Sodium hypochlorite, gently wipe the outside surfaces of the tube which may have come into contact with a contaminated surface.

Allow tubes to dry, write on tube label, all pertinent patient information, and then place labels on samples

Pack laboratory samples safely in a plastic leak-proof biohazard bag with an outside compartment

for any documentation that will accompany sample. This primary bag shall then be placed in another (secondary) biohazard bag.

The biohazard bag (with sample) shall be transported in a sturdy, closed, leak proof container, the outside of which will be decontaminated by wiping the outer surfaces with a gauze dampened in 10% hypochlorite solution, before being brought to the lab.

PROCESSING SAMPLES FOR ROUTINE TESTING

It is recommended that samples for routine testing be performed at the patient's bedside using the Arterial Blood Gas (ABG) machine, which can provide Na, K, Hb, HCT, pH, pCo2, pO2, bicarbonate, ionized Ca.

PACKAGING / SHIPPING

The Packager / shipper must be trained and certified to ship biological substances, and must be certified by International Air Transport Association (IATA) to package and ship Category A Biological substances.

Personnel packaging sample should apply Universal Safety Precautions when performing this task.

At this time the only carrier with qualified personnel to handle and ship Category A biological substances is DHL.

DHL International (Cayman) Ltd.

68 Mary Street

P.O. Box 10651

Grand Cayman KY1-1010

Cayman Islands

Contact Person: **David Gooding (david.gooding@dhl.com)**

GCM Operations Supervisor

Main: +1 345 949 8575 ext 2400

Mobile: +1 345 326 4843

Facsimile: +1 345 949 8384

Other contact persons at DHL:

1. Omar Aitken 326 8183 omar.aitken@dhl.com
2. Hubert Reid 326 8156 Hubert.reid@dhl.com

Fill out and include CARPHA Specimen Submission Forms

Packaging and Shipping Clinical Specimens

Specimens for ruling out Ebola virus infection will fall under Category A, defined as:

Infectious substances that are capable of causing permanent disability, life threatening or fatal disease to humans or animals when exposure occur. In addition, the following criteria also support classifying specimens as Category A:

- Clinical and laboratory features strongly suggestive for Ebola virus infection, or
- Direct contact with a confirmed or symptomatic case, or
- Casual contact with a confirmed or symptomatic case.

Specimen Packaging and Shipping

Specimens collected for EVD testing should be packaged and shipped without attempting to open collection tubes or aliquot specimens. Specimens for shipment should be packaged following the basic triple packaging system which consists of a primary receptacle (a sealable specimen bag) wrapped with absorbent material, secondary receptacle (watertight, leak-proof), and an outer shipping package.

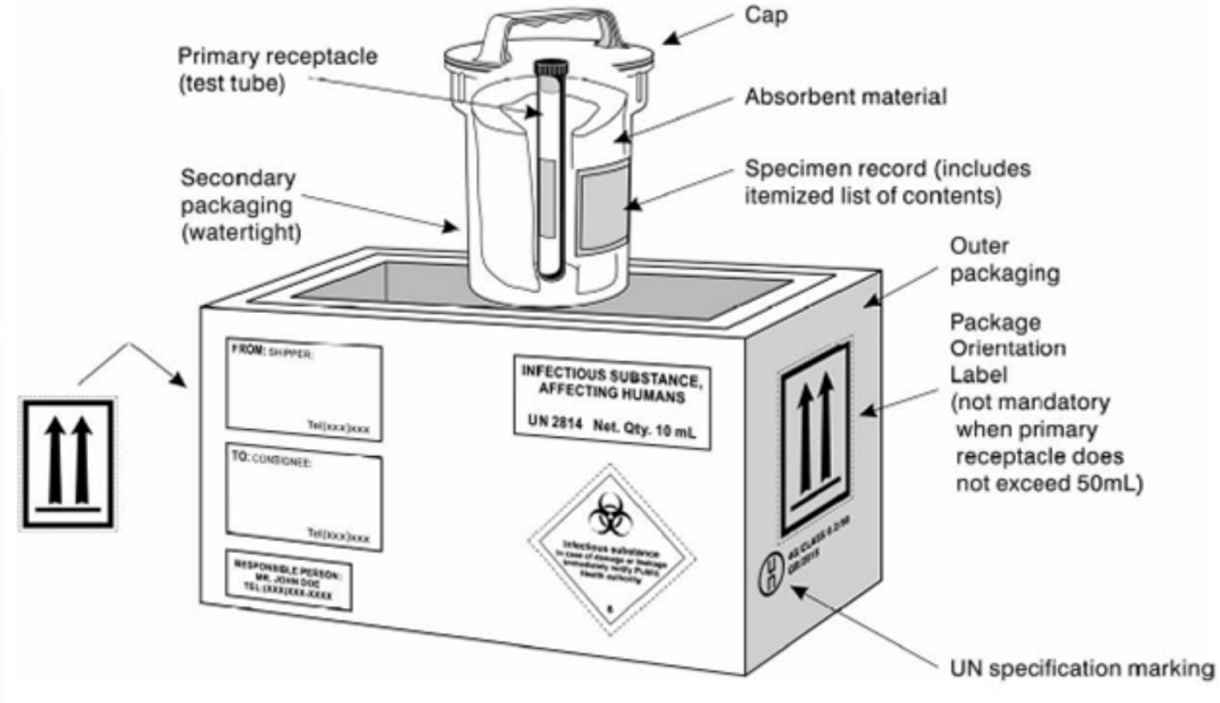


Figure: Example of triple packaging system for the packaging and labelling of Category A, Infectious Substance (Reference WHO Guidance on regulations for the Transport of Infectious Substances 2011-2012)

Specimens should be sent by an overnight courier directly to CARPHA.

- Refrigerated specimens can be sent on 1-2 cold packs.
- Frozen specimens should be sent on dry ice.

Ship directly to:

CARPHA
16-18 Jamaica Blvd
Federation Park

Port of Spain
Trinidad & Tobago

Phone +1 868-299 0820 / 299 0895 / 622 4261

- The Lab will work through the Public Health Department for notification and consultation for Ebola testing requests prior to sending specimens directly to CARPHA, and to determine whether testing for Ebola virus is indicated.
- No specimens will be accepted by CARPHA without prior consultation with the Public Health Department.
- Do not ship for weekend delivery unless instructed by CARPHA.

Revision #	Revised by	Reviewed by	Date	Nature of revision	Supersedes

X. HANDLING AND DISPOSAL OF HUMAN REMAINS

Maybe we can consider converting this policy document as a narrative or inserting the general descriptive in the text and the Policy/Procedure document as an Appendix.

Purpose

The Ebola Virus Disease (EVD) is a contagious virus that can cause a severe and often fatal hemorrhagic fever in humans. This policy gives guidance on the safe handling of confirmed or suspected infected human remains that will control the spread of the virus by using recommended infection control procedures.

Policy

This policy has been prepared with reference to guidelines from the US Centers for Disease Control and Prevention (CDC), World Health Organisation (WHO) and the Cayman Islands Public Health Department. It applies to all HSA staff who handle confirmed of suspected infected bodies and issues strict guidelines for recommended infection control measures to prevent the spread of the virus.

Principal

In patients who die of EVD the virus can be detected throughout the body. Ebola can be transmitted through direct handling of human remains without appropriate personal protective equipment, and through splashes of blood or other body fluids (e.g. urine, saliva, feces) to unprotected mucosa (e.g. eyes, nose or mouth). The 2014 outbreak has witnessed most of the transmissions through human-to-human interactions.

1. CDC recommends that autopsies of patients infected with Ebola should be avoided. Due to a lack of suitable morgue facilities for stringent infection control, the policy for Cayman Islands is that no autopsies will be undertaken on patients who are confirmed or suspected of being infected with EVD.
2. Patients who are confirmed or suspected of being infected with EVD are upon death to be double bagged into leakproof body bags.
3. Once double bagged, the body will be placed into a hermetically sealable casket which will provide a suitable barrier to the virus for those who handle the casket thereafter.
4. This is to occur at the point of death to avoid unnecessary transportation of the infected remains.
5. CDC recommends that no embalming occurs due to the risks of exposure and that the body be cremated of buried promptly. Since there is no cremation facilitates available within the country, all bodies must be buried.
6. Transporting the remains to another country for cremation is not recommended.

Personal Protective Equipment

Safe work practices in handling human remains will prevent the spread of Ebola.

Personal Protective Equipment (PPE) is mandatory for anyone coming into contact with human remains confirmed or suspected of being infected with EVD to reduce the risk of contamination. This must be worn prior to contact with the body, worn during the process of collection and placement into body bags and the casket. It should be removed immediately afterwards and discarded in red biohazard bags for incineration.

The CDC recommends that the following PPE items are worn when handling and bagging infected human remains:

a) Surgical Scrub Suit

b) Surgical Cap

c) Impervious Gown (with fluid resistance with full sleeve coverage – no hood)

d) Disposable Face Shield (goggles are not recommended)

e) Disposable Surgical Hood (covers head and neck)

f) Waterproof Apron

g) Facemask

h) Washable Boots / Closed Shoes

i) Disposable Fluid Resistant Shoe Covers (at least mid-calf)

j) Double Surgical Gloves

Since this is not an aerosol-generating procedure, respirators are not necessary. It is recommended that a trained observer supervises the donning and doffing (i.e. putting on and taking off) of this PPE to ensure proper completion of protocols.

While working in PPE there should be no skin exposed and no personal items carried. Only personnel trained in handling infected human remains, and who demonstrated competency in the use of this PPE (including safe donning and doffing) should touch or move any EVD infected remains.

Procedures

To prevent the spread of infection, immediately after death and at the site of death, the patient is to be double bagged and placed into a suitable casket.

1. Under the supervision of a trained observer in full PPE, two other persons in PPE are to wrap the body in a plastic shroud in a way that prevents the contamination of the outside of the plastic. Change gloves or gown if they become heavily contaminated with blood or body fluids. Leave any intravenous lines of endotracheal tubes in place. Avoid washing or cleaning the body.

2. Place the wrapped body into a body bag. Once sealed, the outer surfaces of the bag are to be washed down with an EPA-registered disinfectant and allowed to air dry to decontaminate. These body bags must be not less than 150µm (to be confirmed) thick, be puncture resistant and sealed in a manner so as to contain all contents and prevent leakage of fluids during handling or transportation.

3. These two persons are to remove the contaminated PPE in a designated area, wash (shower if available) and then place on fresh PPE. These same two persons are then to place the body bag into a second body bag and seal. Once sealed, the outer surfaces of the bag are to be washed with an EPA-registered disinfectant and allowed to air dry to decontaminate.

4. At the point of death, the double bagged body will be placed into a hermetically sealable casket (this is a casket that is air tight and secured against the escape of microorganisms) by the two handlers.

5. The trained observer (in uncontaminated PPE) will wash the outer surfaces of the casket with an EPA-registered disinfectant, allow to air dry to decontaminate and seal the casket appropriately. The observer is required to issue appropriate documentation that the casket has been sealed hermetically in conjunction with this Policy. The paper work should be attached to the outside of the casket so that it is readily visible for inspection.

6. Once sealed, the casket and body bags should not be reopened for any reason.

7. Once an infected body is inside a sealed casket that is free from infectious material on the outside and on visual inspection the seals appear not to have been broken (no leakage has occurred), it is no longer considered a threat of infection to those handling the casket. In any event, disposable gloves will be worn when handling / moving the sealed casket to the burial site.

8. Surface decontamination is to be conducted using an EPA-registered disinfectant that the kills a wide range of non-enveloped viruses (e.g., norovirus, rotavirus, adenovirus, poliovirus). The manufacturer's instructions are to be followed for correct use.

9. After the casket is sealed, the observer and handlers will remove all PPE (to be bagged for destruction if disposable) and wash (shower if available). Any disposable cloths used to wash the surfaces of the bags / casket should also be bagged for destruction.

10. CDC recommends that the casket should be buried "promptly". WHO recommend that this occurs "immediately". In the Cayman Islands, burial is to occur as quickly as possible. This will remove the need to find appropriate storage facilities pending burial.

11. The handling of EVD human remains should be kept to a minimum. The number of persons who are exposed to EVD infected human remains by either touching or handing should also be kept to a minimum. A log is to be kept of all staff who handle infected remains.

12. Donning and doffing of PPE will take place at separate designated areas where control is maintained. Doffing is a high risk process that needs to be done in the correct sequence under close supervision. Doffing areas will require frequent environmental cleaning.

Environmental Controls

1. In the event of leakage of fluids from the body/body bags, thoroughly clean and decontaminate the affected areas with an EPA-registered disinfectant.

2. Wash hands (or gloves) thoroughly with EPA-registered disinfectant or an alcohol based hand rub during the removal and immediately following the removal of PPE.

3. Reusable PPE (boots / shoes etc) should be cleaned and disinfected with an EPA-registered disinfectant.

4. Waste material (including disposable PPE) contaminated with EVD must be handled as infectious substances. These materials should be placed in leak-proof bio-hazard bag and discarded appropriately. To minimise contamination of the exterior of the waste bag, place this bag in a rigid waste receptacle designed for this use. Incineration or autoclaving as a waste treatment process is effective in eliminating viral infectivity and provides waste minimisation. In the Cayman Islands, it is recommended that waste material be incinerated.

5. Transportation of the infectious material to the incineration site should follow the relevant Hazardous Materials Regulations.

6. The ash produced form the incineration is not considered to be infectious and does not pose a health risk.

Transportation

1. Transportation of EVD infected remains should be kept to a minimum.
2. All external transportation (such as to the burial site) should be co-ordinated with the local authorities in advance (e.g. RCIPS).
3. Individuals driving the casket to the burial site do not require to wear PPE, provided that the drivers do not handle the remains and that the remains are safely stored double bagged and inside a suitable casket that has been disinfected according to the above guidelines.

References

Retrieved from *Centres for Disease Control and Prevention* website:

http://www.cdc.gov/vhf/ebola/hcp/guidance-safe-handling-human-remains-ebola-patients-us-hospitals-mortuaries.html

http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html

http://www.cdc.gov/media/releases/2014/fs1020-ebola-personal-protective-equipment.html

http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html

http://www.cdc.gov/hicpac/2007IP/2007ip_part2.html#e

http://essentialhospitals.org/policy/hospital-checklist-other-federal-resources-on-ebola/

XI. PUBLIC EDUCATION

- H.S.A Website – Link to CDC
- Media Updates
- Leaflets
- Posters/Notices

Steps will be taken to organize public education as deemed necessary, depending on the state of alert.

Signatures

Authorising role	Name	Signature	Date
Medical Director, HSA	Dr. Delroy Jefferson		
Director of Primary Care / Medical Officer of Health	Dr Samuel Williams		
Chief Nursing Officer	Dr Hazel Brown		
Chief Medical Officer	Dr John Lee		

Actions:

Documentation that a casket is hermetically sealed needs to be created?

Do Funeral Homes have hermetically sealable caskets?

Do RCIPS/ HSA /funeral homes have leakfree / puncture proof body bags (150µm thick)?

Need a special shower facility?

Need to ensure a proper supply of PPE equipment be bought (hermetically sealable caskets?)

Liaise with Funeral Homes on this policy

Does HSA have EPA-registered disinfectants?