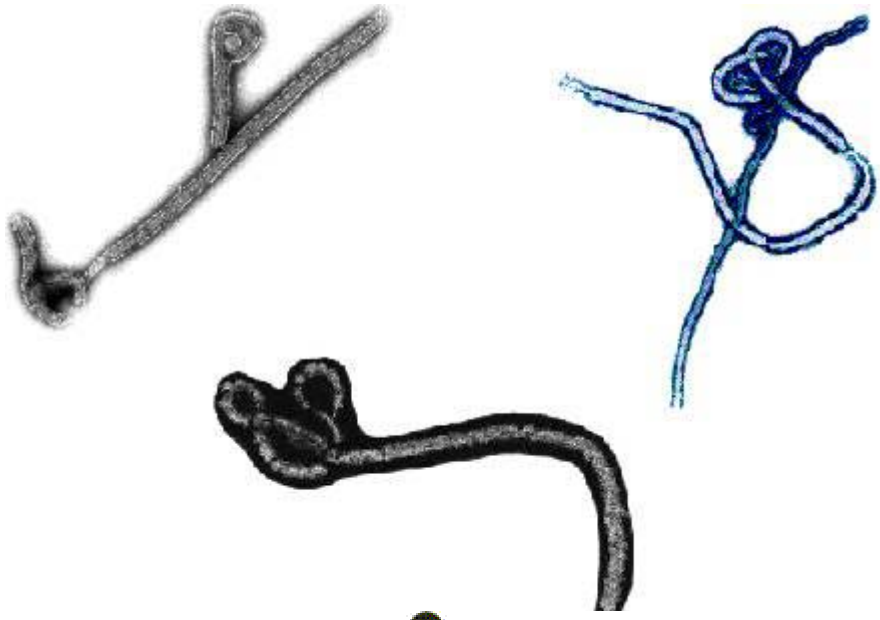
BRIEFING

EBOLA OUTBREAK

PREPAREDNESS & MANAGEMENT

Second version, November 2001
Bruno BAERT
MSF



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Foreword & Acknowledgments

Foreword:

The first aim of this briefing is to give written support to the participant following an Ebola haemorrhagic fever briefing. It contains information on preparedness for and management of Ebola haemorrhagic fever and is written in a way such that it can be used as a practical support document in the field.
This briefing is written for Ebola haemorrhagic fever, but can also be used for Marburg haemorrhagic fever for which preparedness and management of an outbreak are the same.

This document still needs to be improved with your comments and experiences.

Please forward your feedback to Dr. Michel Van Herp, MSF-Belgium, Duprestraat 94, 1090 Brussels.

Acknowledgments

This briefing is dedicated to every person involved in the Uganda 2000 Ebola outbreaks, and especially to the families of those who paid with their lives in fighting the outbreak.

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Special thank also to Rémi Carrier for having taken the initiative for this briefing and to Cécile de Walque for the huge amount of time and energy devoted to helping to compose the Ebola-kit.

June 2001
Bruno BAERT

Executive summary:

Key issues in dealing with Ebola Haemorrhagic Fever (EHF):

A. General Preparedness:

- **Universal precautions** in place in all health infrastructures;
- **General monitoring** via normal surveillance systems;

B. When suspecting an outbreak:

- Contact medical department of headquarters for advice;
- **Assessment and confirmation of case** (outbreak); → module 7 of standard MSF Ebola Haemorrhagic Fever-kit;
    - **Clinical investigation based on case definitions;**
    - **Sampling;**
        - Take adequate protective measures while taking samples;
        - Label sample holders before taking samples, and attach clinical description of suspect case to the sample;
        - Obtain valid and useful samples (respect protocols on taking & storing samples); discard all sampling material safely;
        - Pack samples safely (triple-packaging system) and store according to protocols (cold chain; safety);
        - Respect rules on transportation (packaging, labelling, cold chain);
        - Ensure that consignee (headquarters, WHO, or receiving laboratory) receives a pre-advice message before arrival of samples;
    - **Reinforcement of universal precautions with precautions to reduce VHF transmission in health structures;**
        - While awaiting lab. results, reinforce universal precautions with VHF precautions in all health providing structures (including private), but do NOT implement isolation measures as long as safety is not guaranteed for staff, attendants and (suspect) cases inside a properly set-up and working isolation unit;
        - Temporarily stop all non-life saving surgical interventions and lab tests;
    - **Training;**
        - Give training on:
            - Case definitions; clinical recognition of suspect cases;
            - Methods of transmission and how to break transmission lines;
            - Implementation of Universal- and VHF precautions;
            - Use of protective clothing and barrier nursing techniques;
- Prepare **contingency plan** (for possible intervention in case of a positive lab. result);
        - Investigate possibilities concerning proper site for an isolation unit;
        - Identify the needs in case an intervention has to be started;
        - Ensure availability of a standard MSF Ebola haemorrhagic fever kit on standby in Europe;
        - Check availability of staff;

C. While having an outbreak:

If an outbreak is declared (after laboratory confirmation of a case), order MSF standard Ebola Haemorrhagic Fever Kit. Three main intervention components must be set up in parallel under an overall coordination:

- **1. An epidemiology and surveillance system;**
  - A surveillance system, which will be one of the three main tools in the management of the overall outbreak, must be set up in parallel with the two other components. Main objectives of this surveillance team will be:
    - Providing information on patterns of epidemiological spread and guide the control measures with this critical information;
    - Establishing and coordinating active case finding, contact tracing and follow-up of contacts,
    - Assisting ambulance-, burial-, and social mobilisation teams;
    - Informing health providers (also private) about methods for prevention of infection, and coordinate with them on reporting of cases;
    - Providing regular information on the evolution of the outbreak;
- **2. Proper isolation and case management;**
  - **The main objectives** of proper isolation are to break transmission lines by isolating all (suspect) cases; and providing patients with supportive care. EHF is mainly spread by direct contact with cases or contact with body fluids or infected objects, and requires proper barrier nursing techniques and infection control. Strict safety rules must be in place, and priority must be given to safety of staff, safety of possible patient attendants, and to suspect (but non EHF-infected) cases in order to avoid nosocomial infections.
  - **Isolation** will only be effective if all the following points are met:
    - Criteria on site selection are respected;
    - Site planning and layout meet the requirements;
    - The staff are trained and the isolation unit organised before starting treatment and preferably also before starting admissions;
    - All barrier nursing and infection control protocols are in place and followed;
    - Adequate protective clothing is available and worn as per protocol;
    - Priorities and safety levels in patient care are respected;
    - All (safety) protocols are being monitored constantly;
  - **Activities linked to isolation:**
    - Ambulance and burial teams are trained, operating and respecting procedures;
    - Medical outreach;
      - Monitoring and providing assistance to all health providers for the implementing of:
        - Universal and VHF precautions;
        - Passive case finding & safe holding procedures;
        - Training, sensitisation, and provision of education and information;
        - Safe practices in operating theatres, laboratories and delivery rooms (also traditional birth attendants) in order to avoid nosocomial amplification;

- **3. An information, sensitisation and education system;**
    - The main aim is to give accurate information on the disease in order to:
        - Create or increase community awareness;
        - Enable the community to recognise alert cases;
        - Avoid possible infections linked to behaviour and traditional practices;
        - Avoid stigmatisation of health workers, suspect cases, discharged (and non confirmed) suspect cases;
    - This will mainly be done through:
        - Mobile teams, trained local leaders and community volunteers;
        - Information through mass media (radio, T.V.) and posters & leaflets;
        - Informing and educating through participatory meetings;

Other important issues during an outbreak:

- **Human resources:**
    - Early phase ←→ day to day functioning:

Set up of the intervention (1 week to 10 days) can greatly influence the later day-to-day functioning. A good set-up will contribute significantly towards a good day-to-day functioning. Experienced (VHF-experienced preferably) medical and non medical (experienced watsan with knowledge of infection control) staff, are highly recommended for the set up.

For the **day-to-day** activities inside the isolation unit, the ideal is to work with persons used to all the procedures and reflexes needed for barrier nursing.

- Safety of staff is the priority;
    - All staff must receive clear briefings about the risks before they start working with Ebola;
    - Respect safety rules and protocols → monitored by staff in charge, safety officer, and everybody involved;
    - The stress engendered through the development of a simple fever by a person working in a EHF-outbreak is enormous. Therefore, respect strict malaria prophylaxis & physical protection, and general hygiene measures (food, kitchen..);
    - Take enough rest, especially persons in close contact with EHF;
    - Evacuation related to EHF: be prepared for the following two scenarios;
        - Known incident;
        - Sudden fever;

- Stigmatisation of staff is often a huge problem → psycho-social support;
- Post mission follow up of expatriate staff;
- Early phase pressure from the press, due to the fact that Ebola is still a “hot” disease.
    - If necessary, make available a contact person or press officer to relieve the pressure on the teams;

- **Adequate logistical support:**
  - General support;
    - Set-up (epidemiological base, isolation unit and linked activities, mobile teams);
    - Differences with normal rules and approach (housing, vehicles, security);
  - Supplies: especially protective equipment is a key issue;
    - Quality and requirements for protective gear;
    - Security stocks and consumption: running out of stock of just one protective item, can result in having to stop activities;
  - Check the different kits and their use;

- **Ethical aspects related to:**
    - Media;
    - Science;
    - Barrier nursing;
    - Strict burial protocols.

I. V H F & EBOLA: GENERAL

a. What are Viral Haemorrhagic Fevers (VHF) ?

b. What is Ebola haemorrhagic fever (EHF) ?

c. Reservoir;

d. Main modes of transmission;

e. Sensitivity of the virus;

f. Ebola outbreaks;

a. What are Viral Haemorrhagic Fevers (VHF) ?

The **VHF's** are a group of illnesses caused by viruses of four distinct families: **Filoviruses; Bunyaviruses; flaviviruses** and **Arenaviruses**.

For an overview of main known Viral Haemorrhagic fevers, see annex 1.

Common characteristics of VHF's:

- They are RNA viruses, enveloped in a lipid (fatty) coating.
- Their survival is dependent on an animal or insect host (natural reservoir).
- Humans are not the natural reservoir, but can become infected when they come into contact with infected hosts. For some VHF's, human-to-human transmission can then occur.
- Human cases or outbreaks of haemorrhagic fevers caused by these viruses occur sporadically and irregularly and cannot be predicted.
- The viruses are geographically restricted to the areas where their host species live.
- Apart from a few exceptions, there is no cure or established drug treatment for VHF's; patients receive supportive therapy.

Transmission of VHF's:

They are initially transmitted to humans when the activities of infected reservoir hosts or vectors and humans overlap.

- **natural host → vector (intermittent organism) → Human**
- **natural host → Human → other Human (= secondary transmission)**

Most VHF's are geographically restricted to those areas where their natural reservoir lives, but human infection outside those areas could occur in the case that:

- an infected host or vector is exported from it's native habitat (Infected monkeys → Marburg fever in Germany and Yugoslavia, …);
- an infected person travels elsewhere (only for virus types that can be transmitted by person-to-person contact).

b. What is Ebola haemorrhagic fever (EHF) ?

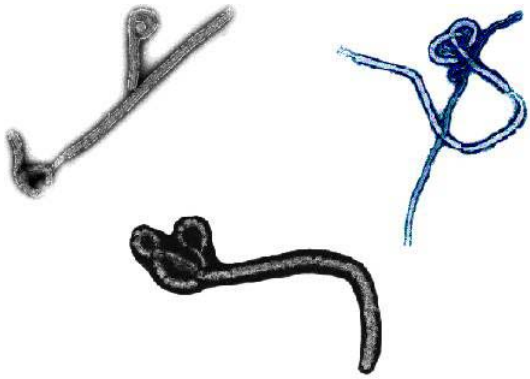
Ebola is a viral haemorrhagic fever (VHF), named after a river in the Democratic Republic of Congo, where it was first discovered in 1976.

Ebola forms together with the Marburg virus the **filoviridae (thread-like)** family.

It is one of the most virulent viral diseases known to humankind, causing death in 50-90% of all clinically ill cases. There is still a profound ignorance about the disease. There exists no specific treatment or vaccine against EHF. Currently, patients only receive supportive therapy.

Till now, there are four different **Ebola sub-types (strains)** known:

1. Africa:
    - Ebola-Zaire (EBO-Z) – (Includes Ebola-Gabon)
    - Ebola-Sudan (EBO-S)
    - Ebola-Ivory Coast (EBO-CI) (= Ebola-Taï)
2. Philippines:
    - Ebola-Reston (EBO-R)



Symptoms:

Most Ebola symptoms are non-specific and similar to symptoms of common tropical diseases (notably malaria, shigellosis, typhoid fever), making a **clinical diagnosis very difficult**, especially outside an outbreak.

The disease often **starts** with sudden and high fever, general weakness, muscle pain, headache, **followed** by vomiting, (bloody) diarrhoea, rash, reduction of kidney and liver functions, internal and external bleedings, chest pain, shock and death.

See also case definition point III. A.1.a.

Incubation period: 2 to 21 days.

Currently used **laboratory tests and techniques** for EHF detection are:

- ELISA (Antigen-capture enzyme-linked immunosorbent assay): Ag; IgG- & IgM-antibodies,
- RT-PCR (Reversed transcription Polymerase chain reaction): detection of genetic material (RNA)
- Immunohistochemistry: detection of viral antigen (skin snip).
- Virus isolation (culture).

c. Reservoir

Even though many ecological studies and much research is being carried out and has been done in and around outbreaks, the natural reservoir is still not known.

d. Main modes of transmission

Natural host → (intermittent organism)→ Human → other Human (= secondary transmission)

Ebola Haemorrhagic Fever is transmitted by:

- **Direct contact** with infected body fluids (blood, vomit, excreta, sweat, etc), organs and semen of infected persons **or indirect contact** (contaminated materials).
- Infection can occur through handling infected (ill or dead) animals. Infection through non-human primates is already documented several times (Gabon, Côte-d'Ivoire..).
- No evidence of transmission during incubation period.
- Transmission through semen may occur. (Ebola virus-RNA was found in semen up to 3 months after clinical recovery of patients).
- Possible transmission via droplets, especially when working nearby (coughing) patients.
- Airborne: no evidence for EBO-Z and EBO-S, but see note.

Note:

EBOLA is in principle not airborne. Although, "…both guinea pigs and monkeys have been infected experimentally with EBO virus by direct installation of drops into the eye and throat. Transmission of EBO virus from experimentally infected monkeys to control monkeys in separate cages has also been documented. Furthermore, airborne spread was suggested during the EBO epizootic outbreak in Reston, Virginia. In a review, Peeters et al. concluded that although the major mode of transmission of haemorrhagic fevers is direct contact, transmission via large droplets, aerosolised particles, or fomites cannot be excluded." J Infectious Diseases 1999; 179 (Suppl. 1) S 95

…"As in previous outbreaks in human populations, we found no clear evidence of small-particle aerosol transmission, although it is not possible to conclusively rule out the possibility of such transmission in rare circumstances." J Infectious Diseases 1999; 179 (Suppl. 1) S 91.

e. Sensitivity of the virus

The Ebola HF virus appears to be quite fragile due to its vulnerable lipid (fatty) envelope and can be fairly easily destroyed by disinfection, heat and even direct sunshine (UV). The CDC guidelines recommend the use of soapy water, as well as chlorine solutions (0.05% & 0.5%) to destroy the virus in a field setting.

f. Ebola outbreaks

Up till now, the main confirmed human outbreaks have occurred in RD-Congo, Sudan, Gabon and Uganda.
Other confirmed human infections have been reported in Ivory Coast (EBO-CI), The Philippines (EBO-R antibody positive persons, but without evidence of developing any symptoms), and some Western countries, mostly linked to monkey facilities, laboratories or nosocomial infections (South Africa).

For an overview of main Ebola outbreaks, see annex 2.

II. HOW TO REACT ?

A. Emergency preparedness and prevention.

B. Steps to take when suspecting VHF.

C. What to do upon confirmation of an outbreak. Short overview.

A. EMERGENCY PREPAREDNESS & PREVENTION.

a. General monitoring and large-scale surveillance

b. General prevention of possible nosocomial amplification

c. Having an emergency stock

a. General monitoring and large-scale surveillance

→ difficult and almost not feasible:

- Human outbreaks occur sporadically and irregularly
- The occurrence of outbreaks cannot be predicted
- Most Ebola symptoms are non-specific and similar to symptoms of common tropical diseases (notably malaria, shigellosis, typhoid fever), making a clinical diagnosis very difficult.
- Clinical diagnosis is difficult and presumptive. Confirmation can only be done through laboratory diagnosis. This entails dependence on blood-sampling equipment and access to qualified labs with EHF testing capacities (Bio-Safety Level 4) **[*1]**.
- Although, collection, storage and safe transportation of samples still is a major problem in large surveillance, it has **now become easier and more feasible** with the possibility of basing lab confirmation on testing of post mortem skin specimens (**skin-snip biopsy**).

  With this sampling method, testing still needs to be done in highly qualified laboratories, but samples are inactivated and thus safe for transport and storage. The second advantage of the skin-snip is that it can be stored at room temperature.

For more info. on collection of samples, storage & conditioning, transport*, see point II. B. a.*

[*1] See also point III. A. 1. i. For field laboratory testing.

b. General prevention of possible nosocomial amplification:

This is an aspect on which every health worker can and must work. The use of **universal precautions** *(see point II. B. c)* should be implemented and reinforced in all health structures. This not only for EHF, but also for other infectious diseases.

c. Having an emergency stock:

Having a complete standard MSF Ebola Haemorrhagic Fever Kit, can be useful in very high-risk areas, but due to the fact that human outbreaks occur very sporadically and irregularly, this should be co-ordinated internationally between MSF-sections.

A better option would be to have available in the field only the sampling & Assessment Module (module 7) of the kit for identification of possible outbreaks. The complete MSF Ebola Kit can then be ordered if an isolation unit has to be set up after lab confirmation of a positive case.

For more information and description of this module and the complete standard MSF Ebola Haemorrhagic Fever Kit, see point III. E. 3. and annexes 24 and 25.

B. STEPS TO TAKE WHEN SUSPECTING VHF

a. Confirm the outbreak: Collection of samples, storage & conditioning, transport;

b. General training on VHF and EHF;

c. Reinforcement of general universal precautions;

d. Putting in place precautions to reduce VHF transmission in health facilities;

a. Collection of samples, storage & conditioning, transport

When an EHF outbreak is suspected, laboratory confirmation is necessary. This confirmation can only be done in a small number of laboratories in the world, equipped with a BSL-4 (Bio-Safety Level 4) unit. ***1**

For addresses of laboratories with EHF testing possibilities, see annex 3.

***1** See also point III. A. 1. i. For field laboratory testing.

1. **Before taking samples:**

- **Contact headquarters and WHO** for advice on special instructions for collecting and shipping samples.
- **Take adequate protective measures and handle with extreme caution,** you will possibly handle very infectious (biohazard) material.
- Respect **protocols** (way of taking sample, cold chain) in order to obtain **valid and useful samples.**
- Respect **international rules on packing and shipping of infectious substances (IATA-regulations).**
- Know **how and where** you will **send your samples.**
- **Label each sample properly before taking it** (**date** and **code,** referring to individual record of case database or case report form)
- Accompany samples with **clinical description** of suspect case**.**

2. Sampling:

What	Whole blood in dry tube (vacutainer)	Whole blood dried on filter paper.	Skin-snip biopsy	Liver biopsy (punction)
From whom	Living suspect cases; Suspect cases shortly after death.	Suspect cases.	Dead suspect cases. Ideally take skin snip of the eyelid. If not possible, take in nape of the neck.	Dead suspect cases.
Storage	Sample will have most value if cold chain respected. Preferably frozen: (-70-80°C = ideal) If freezing not possible, keep cool (see remark 2). Avoid temp. variations.	After collection: do NOT dry by heat or in sun. STORE sample in cold dry conditions.	Fix in 10 % formalin. Can be stored at room temperature. Is not infectious any more once fixed in formalin. Do NOT freeze.	Fix in 10 % formalin. Can be stored at room temperature. Do NOT freeze. Is not infectious any more once fixed in formalin.
Shipping	(Ideally) dry ice or ice packs at -70 or 80 °C. IATA-regulated: "Infectious Substances".(*1).		Do NOT freeze. Can be sent by normal mail, but pack in triple packaging.	Do NOT freeze. Can be sent by normal mail, but pack in triple packaging.
Possible testing if well handled	Viral antigen, IgG and IgM antibody, viral RNA, virus isolation.	IgG and IgM. Ag: not yet sure, tests are still being done in CDC (05/2001).	Viral antigen. (Immunohistochemistry).	Viral antigen.
Remark 1	If well taken and handled, this sample will provide the most complete testing results.		Only useful when virus titers are extremely high (acutely ill persons, or persons who have died from Ebola).	Should ONLY be done by physicians experienced in biopsy sampling.
Remark 2	Can be stored and sent at room T° for short time (1week), but this can decrease the testing value of the sample.		Different sensitivity for different viruses and sub-types (EBO-Z =~ 100%; EBO-S =~70%; Marburg =~ 50%). Cannot be used for all viral haemorrhagic fevers.	More viruses can be tested than with skin snip.

(*1) Shipping should normally be done under “Infectious substances” regulations, however, an agreement between IATA and WHO exists which allows to send blood samples under “diagnostic specimens” as long as one is not sure that it contains the Ebola virus.

All sampling material is included in the standard MSF Ebola Haemorrhagic Fever Kit (module 5) and in the Assessment module (module 7). An explanation of which material is used for the different sampling methods is given in the *Kit description, point III. E. 3 and annexes 24 and 25.*

Basic triple packaging system, labelled for Infectious substances.

-<u>Other sampling possibilities</u>:

There are other sampling possibilities such as plasma, blood clot, fresh frozen tissues and Formalin-fixed tissues.
All can be used for certain testing assays, but the issue will not be elaborated here.

Taking blood sample (vacutainer). Gulu – Uganda 2000.

Skin-snip biopsy tools.

Blood sample on filter paper.

3. <u>TRANSPORTING & IATA REGULATIONS:</u>

The transport of some samples (see sampling descriptions), are subject to **strict ICAO** (International Civil Aviation Organisation) / **IATA** (International Air Transport Association), **UPU** (Universal Postal Union) **regulations** concerning packaging, labelling and transport.
Apart from the regular ICAO / IATA and UPU regulations on Infectious Substances and Diagnostic Specimens, there are also **State variations** and **Operator variations**.

Due to regularly changing regulations, and to the exceptions per operator and country, an exact procedure description is almost impossible. If you have to send samples, **ask your medical department and if possible the WHO representative** how to proceed for your specific case.

General requirements (**For information only, check before shipping**):

- For **both "Infectious substances" and "Diagnostic specimens**" a "Basic triple packaging" system must be used.

Basic triple packaging system:
Samples have to be packed in **three containers**.

- Inner water-tight box, containing the sample;
- A second water-tight box, containing enough absorptive material between this second box and the first box, to absorb all the fluids of the sample, in case of leakage of first box;
- Outer shipping package, protecting the secondary box from outside influences, such as physical damage and water.

Specimen data forms, letters and possible other info regarding specimen, shippers and consignee identification should be taped outside the second container.

- **"Diagnostic specimens"**

-Bood samples on filter paper

-Skin-snip; Liver biopsy (*2)

- **"infectious substances"** →

- Liquid Blood in vacutainer (*1)

For more on regulations on Diagnostic specimens and infectious substances, see annex 38.

(*1) Shipping should normally be done under "Infectious substances" regulations, however, an agreement between IATA and WHO exists which allows to send blood samples under "diagnostic specimens" as long as one is not sure that it contains the Ebola virus.

(*2) : Skin-snips and liver biopsy samples inactivated in 10% formalin are not infectious any more. They could thus be sent by normal mail, but preferably send them under "diagnostic specimen" regulations.

4. REQUIREMENTS FOR AIR MAIL:

Both Infectious substances and diagnostic specimens may be shipped by registered air-mail.

For more on regulations on sending samples by air mail, see annex 38.

5. A ***list of main WHO Collaborating Centres on EHF*** *is given in annex 3.*

b. General training on VHF and EHF

While assessing the situation, and waiting for lab-results of the suspect samples, **training** should be given on at least the following aspects:

-case definitions;

-clinical recognition of EHF based on surveillance case definition;

-universal and VHF precautions;

-ways of transmission and how to break transmission lines;

-use of protective clothing & barrier nursing techniques (but do not implement isolation as long as safety is not guaranteed for staff, attendants and (suspect) cases inside a proper set-up and working isolation ward);

See also annexes 35 and 36 for examples of training modules.

c. Check general universal precautions

and reinforce them by implementation of **«precautions to reduce VHF transmission in the health facilities»**

d. Implementation of precautions to reduce VHF transmission in health facilities.

See next page.

As soon as a VHF suspicion arises, the use of **«universal precautions»** and **«precautions to reduce VHF transmission in the health facilities»** of the suspect area must be checked, and implemented where not in place.

This is a **priority, in the first phase** of suspicion of the disease, to avoid further nosocomial amplification (spread of disease in a health-care settings).

→ *For description of **universal precautions,** see annex 37.*

→ *For description of **precautions to reduce VHF transmission in the health facilities**, see next page.*

→ For complete barrier nursing isolation and practices, see Chapter III. B. «ISOLATION».

PRECAUTIONS TO REDUCE VHF TRANSMISSION IN HEALTH FACILITIES

1. Isolate patient
2. Avoid giving injections or taking blood
3. Wear protective material when touching/examining patient
4. Wear mask & goggles if splash anticipated
5. Dispose of contaminated materials safely
6. Use disinfection procedures
7. Close lab. and operation theatres until safe working is guarantied

1. Isolate patient:

- cover mattress with reusable plastic sheet;
- limit patient movement and restrict access to 1 trained patient attendant;
- instruct attendant to avoid touching patient and provide protective gear to attendant;

2. Avoid giving injections or taking blood

3. Wear protective gear when touching/examining patient

4. Wear mask and goggles

- especially if splash is anticipated or patient is coughing;

5. Dispose of contaminated materials:

- use plastic bag receptacle for contaminated materials such as used latex gloves, or other disposable materials used by patient. Discard and burn contaminated materials.

6. Use disinfection procedures:

- prepare 0.5% and 0.05% chlorine solutions according to instructions;
- disinfect the following items in 0.05% chlorine solution:
  - household gloves, aprons, goggles;
  - medical equipment such as thermometers;
  - cups and dishes;
- disinfect gloved hands after contact with patient in 0.5% chlorine;
- disinfect patients excreta, vomit, urine;
  - add 0.5% chlorine to the container to cover contents and discard in latrine;
  - wash container with soapy water and discard in latrine;
  - rinse container with 0.5% chlorine (container may then be re-used) ;
- disinfect spills of body fluids with 0.5% chlorine to cover completely;
  - let stand for 15 minutes;
  - remove with rag or paper towels;
  - discard rag in plastic bag for infected waste;
  - wash area with soap and water;
- disinfect patient clothing and bedding before laundering;
  - soak soiled clothing in 0.05% chlorine for at least 30 minutes or longer;
  - remove and place in a container of soapy water overnight, rinse thoroughly and dry on line;

2. Close labs and operating theatres to non-life saving surgery until safe working is guaranteed.

Note : «Precautions to reduce VHF transmission in the health facilities» must be applied in all regular health facilities inside the suspected epidemic area as soon as VHF suspicion arises.

In the isolation unit, complete barrier nursing and infection control techniques will be used. Those are described under point III. B.

C. WHAT TO DO AFTER CONFIRMATION OF OUTBREAK ? Short overview.

a. Preamble.

Get an epidemiological overview of the size and evolution of the epidemic (cases, suspect cases and contacts). This information will help in identifying and coordinating where and how to stop transmission lines. Main tools for breaking transmission lines are education and sensitisation of target community and isolation of (possibly) infected cases.

b. Strategies & possible MSF approaches.

The general approach to control an outbreak is based on three main components, :

- **epidemiological-surveillance system**, linked to an
- **information, education-sensitisation** component and a
- **case management** (safe referral-isolation-burial activities) system.

Depending on the size of the outbreak, the location, (urban or rural environment, health facilities and infrastructure or not), and operational actors in the field, the set up will be slightly different in each outbreak, but the general approach will always have the same basic components.

Different MSF approaches:

If MSF is an operational partner in an outbreak, different approaches are possible:

→ **Overall coordination and management** of the whole outbreak.

→This is **not likely**, unless a very small outbreak with no other operational actors (WHO, CDC, ..) present.

→ **In charge of one of the components** (e.g. Isolation and activities linked to isolation, Medical outreach),

→**Most likely** what will happen.

III. TAKING IN CHARGE OF AN OUTBREAK

A. EPIDEMIOLOGY.

- **Defining and organising the surveillance system.**

B. ISOLATION.

- **General principles;**
- **Site selection & criteria;**
- **Site planning & layout;**
- **Organising of Isolation unit;**
- **Barrier nursing & Infection control;**
- **Water and sanitation;**
- **Case management;**
- **Closing down an isolation unit;**

C. ACTIVITIES LINKED TO AN ISOLATION UNIT.

- **Ambulance and burial teams;**
- **Medical outreach;**
- **Sensitisation, Education & Information;**

D. ADJACENT AREAS.

- **Preparedness of adjacent areas during an outbreak.**

E. LOGISTICS.

- **General logistic support;**
- **Consumables;**
- **Kits;**

F. HUMAN RESOURCES.

- **General considerations;**
- **Expatriate human resources;**
- **Local human resources;**

G. ETHICS.

A. EPIDEMIOLOGY

1. Defining and organising the surveillance system

a. Ebola case definition;
b. Main objectives of surveillance and epidemiology;
c. Practical organisation of surveillance;
   - **Community Alert System;**
   - **Peripheral Health Care Unit Alert System;**
   - **Mobile Surveillance Teams;**
d. Case reporting and monitoring;
e. Contact reporting and monitoring;
f. Data management;
g. Use of information collected by surveillance system;
h. Rumour and information management;
i. Lab present or not;
j. Mid-term surveillance;

1. Defining and organising the surveillance system

The purpose of epidemiological surveillance is to confirm the outbreak, to identify all cases and contacts, to detect patterns of epidemic spread, to estimate the potential for further spread of the disease, and to determine whether control measures are working effectively. It must be implemented promptly upon arrival to site.

Uganda 2000 EHF outbreak – Gulu surveillance and epidemiology coordination centre.

a. Ebola Case and Contact definitions

ALERT DEFINITION (NOTIFY LOCAL HEALTH CENTER OR MOBILE TEAM):

- Any case of sudden onset of high fever **OR**
- Sudden death **OR**
- Bleeding or bloody diarrhoea or blood in urine

SUSPECTED CASE DEFINITION (REFER TO HOSPITAL):

All persons, living or deceased, with:

- contact* with a case of Ebola Haemorrhagic Fever ***and***
- fever

OR

- fever ***and***
- 3 or more of the following symptoms:
  - headache
  - vomiting
  - loss of appetite
  - diarrhoea
  - weakness or severe fatigue
  - abdominal pain
  - body aches or joint pains
  - difficulty in swallowing
  - difficulty in breathing
  - hiccoughs

OR

- Unexplained bleeding of any kind

OR

- Any unexplained death (complete forms and notify burial team)

A contact is any person who comes into contact with a case by

1. Sleeping in the same household within one month
2. Direct physical contact with the case (dead or alive)
3. Touching his/her linens or body fluids

Laboratory-confirmed cases are patients with either Ebola virus antigen, or antibody (IgG) against Ebola virus detected in blood samples.

Use of **case definition:** Mobile teams, peripheral health units.

NOTE:
Other risk factors: burial attendance, hospital admission, injection or vaccination in previous 21 days.
Possible indicator: Spontaneous abortion.

The above case, contact and alert definitions, are those used in the Uganda 2000 outbreak. Of course, case definitions can (do) change as the knowledge of the disease improves.

b. Main objectives of surveillance and epidemiology.

- Establish **active case finding** in the community;
- **Identify contacts** of cases, and systematically follow these contacts for signs of disease for 21 days from the date of their last contact with a case;
- **Co-ordinate** with ambulance and burial teams for patient transport and burial;
- Assist the **social mobilisation** team(s) by continually **educating** the population regarding prevention of infection;
- Collect all information on the outbreak (cases, contacts, deaths, laboratory results) and establish databases for **epidemiological analysis** and mapping so as to **guide critical decisions** about outbreak control;
- Provide regular **information** on the evolution of the outbreak and interventions to the local health authorities and international community;
- **Inform the health providers** about methods for prevention of infection and seek their collaboration on reporting of cases;
- Provide a framework that would **ensure sustainable surveillance up to the end of the epidemic** (defined as 42 days after the last case) and integration of post-outbreak surveillance into routine surveillance activities.

c. Practical organisation of surveillance

1. **Community Alert System**
2. **Peripheral Health Care Unit Alert System**
3. **Mobile Surveillance Teams**

- **1. Community Alert System.**

Train a network of people in the community to:

- recognise “Alert Cases”;
- additional follow up of contacts of cases for signs of disease;
- educate the community;
- report alert cases to mobile teams, local health care units;

- **2. Peripheral Health Care Unit Alert System.**

Train peripheral health care workers to:

- evaluate whether the patient is a suspected case;
- report the case to a mobile team or to the operations centre;
- hold the case safely until a mobile team or ambulance team arrives (if health care centre with in-patient facilities);
- educate the community on Ebola prevention;
- put in place or reinforce universal precautions;

When training is given and understood, a health centre kit (*see annex 22*) has to be given.

- **3. Mobile Surveillance Teams.**

Train and equip mobile surveillance teams to be able to do:

- active case finding;
- contact tracing & follow-up;

* Mobile teams report to, and are directly co-ordinated by the central co-ordination.

* Mobile teams are mostly composed of 2 to 6 people, of which preferably at least one should be medical.

* The number of teams will of course depend of the size of the outbreak. For example, In Gulu (Uganda 2000), there were 32 teams with a total of 128 persons.

* Mobile teams going into distant locations, will probably need to be equipped with cars and communication material *(See also point III. E. 1. General logistic support)*, and should have at least one medical person.

d. Case reporting and monitoring

Suspect case – Uganda 2000 outbreak

For each suspect case a **case reporting form** (*annex 6*) has to be completed by the mobile teams or in the isolation unit (self referred patients).
Main info on this form: name, age, location, symptoms, contact with a previous case and status (alive or dead). A copy should be given to the isolation unit AND to the epidemiology unit (**carbon paper**). (Once form inside the unit, should never leave it).

The **case reporting forms** have to be centralised daily and entered in the epi-database.
Updates on the case classification according to the initial medical examination in the isolation wards and according to the laboratory results are also to be centralised as soon as available.

NOTE:

If the surveillance system is not well set up from the beginning, difficulties in updating databases can arise. Main causes can be, the complex flow of information, the absence of a **common identifier** allocated at the time of identification of a case (NAME and ORIGIN), the multiple sources of information, the collection of the same information by different persons and different way of collection.

e. Contact reporting and monitoring

When a suspected case is identified by the mobile teams, his/her contacts (*see contact definition in point a.*) have to be recorded in order to obtain following information:

- Identification;
- Location;
- Date of last contact with the index contact.

(See Contact recording form in Annex 7).

* To give an idea: In Gulu (Uganda 2000) outbreak, about 5 000 contacts were followed up.

f. Data management

- Checking of case- and contact reporting forms, and entering the data into databases *(Case table and Contact table)*;
- Updating of possible lab results and findings of initial medical examination in the isolation wards into the databases;
- Checking data for duplication and accuracy within and between databases;
- Data analysis and reporting (epidemiological analysis);
- Editing of contact tracing forms;
- Input into the co-ordination of surveillance activities.

g. Use of information collected by surveillance system

Intervention steering / guidance:

- To **improve active case finding** activities and community awareness in areas of high-risk transmission, or in newly infected areas or villages.
- To **direct mobile teams** in their follow up of contacts in incubation period and possible referral to the isolation ward in case of symptoms suggesting Ebola fever.

.
Information / communication: To inform health authorities (M o H), WHO, national and international community and media about the number of cases, deaths, admissions, etc.

h. Rumour and information management

A rumour registry must be established to systematically record rumours of cases.

This should meet following recommendations:

- well defined person(s) at a well defined and easily accessible place;
- available 24 hours a day;
- in contact with both the local community and the investigation and control teams;
- register must be carefully maintained, and used to provide information for the investigation teams;
- its existence must be widely advertised in the community;

If telephone available → hot line.

i. Lab present or not

Labs with the capacity to test for Ebola are rare in the world, and usually require a Bio-safety level 4. Although, a “simplified” lab was for the first time set up and used in the field in Uganda 2000 by CDC. In this lab, EHF testing was done using, using Elisa and PCR tests.

It is not sure at all if this will be done again in future outbreaks. It will not only depend on the willingness of highly qualified institutions like CDC, who are able to set up and run such a lab, but also on availability of staff (who could be busy with other field work), and the field conditions (some laboratory equipment can only be set up under certain conditions and requirements on for example buildings and energy).

Gulu 2000 - CDC field lab inside Lacor Hospital

The existence of a laboratory in the field is a **great advantage** to be able to:

- **Screen** the suspected patients in less than 48 hours;
- **Increase the specificity** of the diagnosis (if done on day 4 or later after onset of symptoms).
- This can **avoid isolation of non-cases** (associated with a risk of nosocomial infection);
- It **decreases the work-load** of the medical staff in the isolation ward and workload of the mobile teams in terms of the number of contacts to follow-up.

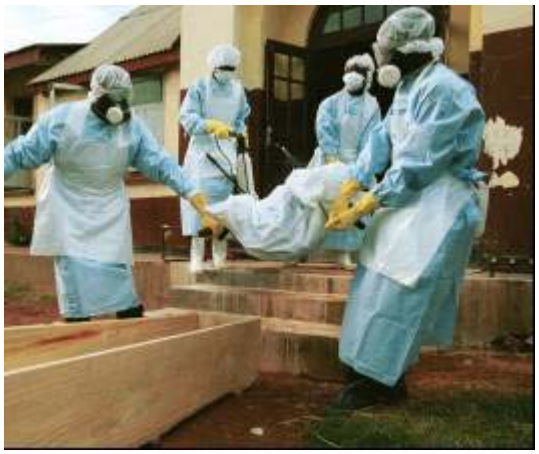
j. Mid term surveillance

When an outbreak is over (42 days after last known contact with a positive case), a surveillance system must be maintained, able to detect a possible new occurrence of the disease. This can be integrated in the usual existing surveillance system.

B. ISOLATION

1. General principles
2. Site selection & criteria
3. Site planning & layout
4. Organisation of Isolation unit
5. Barrier nursing & Infection control
6. Water and sanitation
7. Case management
8. Closing down an isolation unit

UGANDA 2000 - Gulu Hospital Isolation Unit.



UGANDA 2000 – Burial team at Gulu Hospital.

1. General Principles

All medical and non-medical activities inside an isolation unit are closely linked, which makes good coordination between both essential.

ISOLATION PRINCIPLES → Why – Priorities – How

Why:

- To **stop the spread** of the disease by isolating infected cases;
- **Provide a safe environment** for patient management;
- Provide **supportive care** for cases;

Safety & priority levels inside Isolation Unit:

- ***Prevent nosocomial infections (amplification)***
  - **1 : PROTECT staff**
  - **2 : PROTECT attendants**
  - **3 : PROTECT other suspect patients**

Only if levels 1, 2 and 3 are achieved:

- ***Treat patients***
  - **4 : ORAL Medication & oral rehydration**

If safety and benefits of levels 1 to 4 have been maximized for every staff member, attendant and patient, advancing to level 5 may be considered if all required conditions such as enough light when putting IV's at night, etc.., are fulfilled.
Every intervention at this level carries a cost of **increased workload and exposure to staff**.

- **5 : IV rehydration and other injection**-related therapy

- **6 : INTENSIVE care**, difficult in field settings

How:

- **Planning** must be done allowing all practices to be carried out in a simple, straightforward and easy manner, thus providing a safe working environment.
- **Implementing** strictly all planned (safety) measures and systems.
- **Monitoring** continuously that all measures and systems are actually implemented, and that all staff are rigorously following all (safety) procedures.

2. Site selection - Criteria

Adequate site selection will ease the set up, and will contribute towards the good functioning.

1 Possibility to control spreading of infectious material

- Sufficient distance from community settlements and activities to prevent contamination;
- All facilities, must be inside the isolation unit;
- To allow effective cleaning, buildings must have reasonable smooth impervious floors and walls.

2 Enough space to house patients

- Suspected and confirmed cases must be separated to prevent cross infection.
- In order to limit the risk of cross contamination, single patient rooms are better than a ward. Although, in most of the settings, and especially in large outbreaks, this will not be possible.
- Anticipate enough space for possible expansion.

3 Local support

- Support from Local leaders and local authorities is a precondition of setting up and running an isolation facility.

4 Quick to set up

- In case of an emergency response the isolation unit should be operational as soon as possible;
- It might be necessary to choose a temporary site, or hold the patient at home, while a more long term location is being prepared. → *household kit see point III. C. 2. 3.*

5 Close to the epicentre

- Transport of patients and corpses will increase risk of spreading EHF, so the isolation unit should be as close as possible to the epicentre of the outbreak.

6 Availability of water

- Availability of sufficient quantities of water for cleaning and consumption purposes is a necessity (300 to 400 litres per patient per day for a 10-bed isolation unit).

7 Availability of staff

- Medical and non-medical staff must be available (*see point III. F.3.6*).

NOTES:
-Putting in place isolation facilities in an already infected structure with patients inside will make it difficult to achieve an ideal set up, and increases risks for the workers setting it up.
Ideally, all construction, installation and preparatory works should be finished before the first patient arrives.

-An existing isolation ward in a hospital, e.g. a cholera isolation ward, will probably meet many of the above-mentioned criteria.

-An open setting, for example in a camp, village, or compound, should be avoided, as organisation of supportive measures is difficult. Although, in extreme situations it may be necessary to establish a sanitary cordon around the compound or village where an EHF patient has been identified. A more appropriate site can be found and set up in the mean time.

-Setting up a tented isolation, as is usual in cholera outbreaks, is not advisable (difficult infection control), but can be considered if no appropriate building(s) can be identified.

3. Site planning & layout

1. Considerations:

- A **well planned** set up of the isolation unit with a clear and easy circulation of people and material, allowing all practices to be carried out in a **simple, straightforward and easy manner** is the **only way to achieve an effective infection control and a safe working environment**;
- There need to be **strict separations** between **clean and dirty circuits** (people, material);
- **Well positioned** locations for entrance, exit and corridors are **essential** to achieve a clear and easy circulation without cross contamination;
- All **Low Risk** facilities are **planned around the High Risk core group** of facilities. *An example is given in point III. B.3.7: "Plan of VHF Treatment Centre".* Practically, the set up will have to be done according to the nature of the site.

If possible:

- Have **adequate ventilation** → Evacuation of chlorine gasses.
- **Avoid air-condition** → To prevent airborne or droplet transmission of infectious agents.
- **Screened windows**→ To prevent transmission of mosquito- and other insect-borne diseases.
- Keep in mind **slope of the terrain** → Prevent contaminated water flowing outside risk zones.
- **Burning** site should be **downwind**.

2. Facilities needed inside an isolation unit**:**

- Suspected cases ward (or rooms);
- Confirmed cases ward (or rooms);
- Latrines, baths for suspect patients;
- Latrines, baths for confirmed patients;
- Waste zone (burning pit, sharps pit, placenta pit);
- Mortuary;
- Facilities for care givers if they are admitted;
- Laundry area;
- Doctor's room;
- Store room;
- Changing room 1;
- Changing room 2;

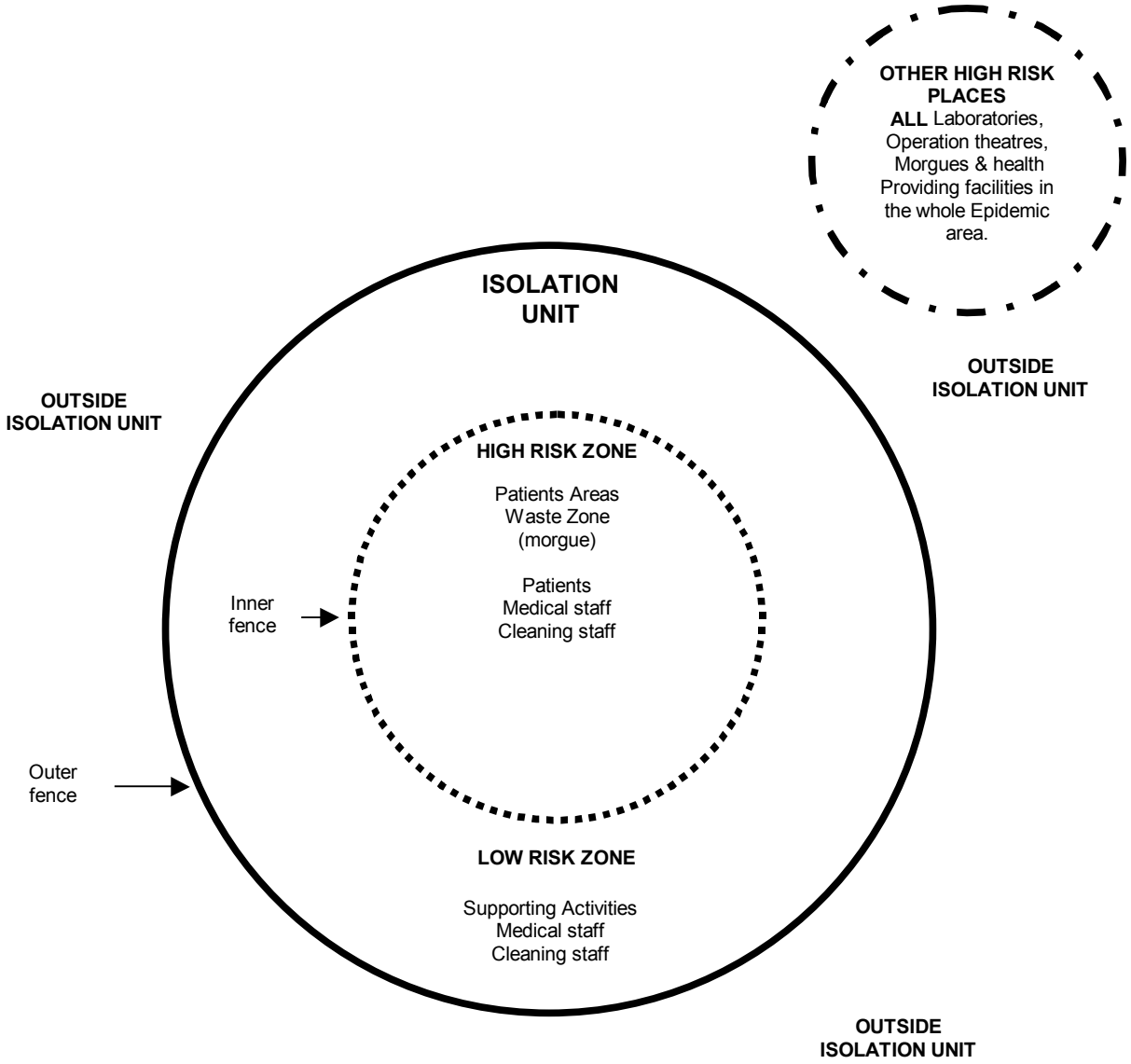
3. Integrating the facilities in a well-considered and complete isolation unit**:**

Division of isolation unit into **different and separated risk zones (HIGH & LOW risk).**

- Physically separated from outside (walls, fences..);
- Only accessible for authorised people, through well-defined gates while using well-defined protocols (disinfection, dressing);
- Locate facilities in appropriate risk zones;
- Separate risk zones from each other;
- Build sluices between risk zones.

NOTE: Consider enough space for possible later sub-division of risk zones (confirmed, probable, suspect, unlikely ..); paediatric ward.

4. Risk Zones



High-risk zone:
The HIGH-RISK zone is the area inside the isolation unit, where patients are cared for, and contaminated waste is being treated. This zone is highly contaminated. All material coming directly into contact with the patient (stools, vomit, cups and bed) and everything else present in this zone: waste, staff, and material is considered as being contaminated. Full protective clothing is necessary. Only patients and designated staff must be allowed into this zone. All material that is being used in the HIGH-RISK zone must stay in the HIGH-RISK zone. Waste treatment must take place in the HIGH-RISK zone only.

Low-risk zone:
The LOW-RISK zone refers to the area inside the isolation unit where the supportive activities take place, chlorine preparation, doctor's room, laundry, and stores.
Infection can occur due to movement of contaminated people and material. Due to the potential of infectious material being present, some protective measures are necessary.

Outside isolation unit zone:
This zone is the area outside the isolation unit, where no infectious (EHF) material should be present. However, the isolation unit is in most of the cases on the hospital compound, where there is a general risk of nosocomial infection. General Universal precautions and precautions to reduce VHF in health settings should be in place. Furthermore, as it is an epidemic, infectious material or infected persons can be everywhere.

Other High risk places:
All Morgues, laboratories, operating theatres as well as health centres (also private) in the whole epidemic zone are also places with high risk for infection. Lab's and operating theatres must be closed until safe working is guaranteed.

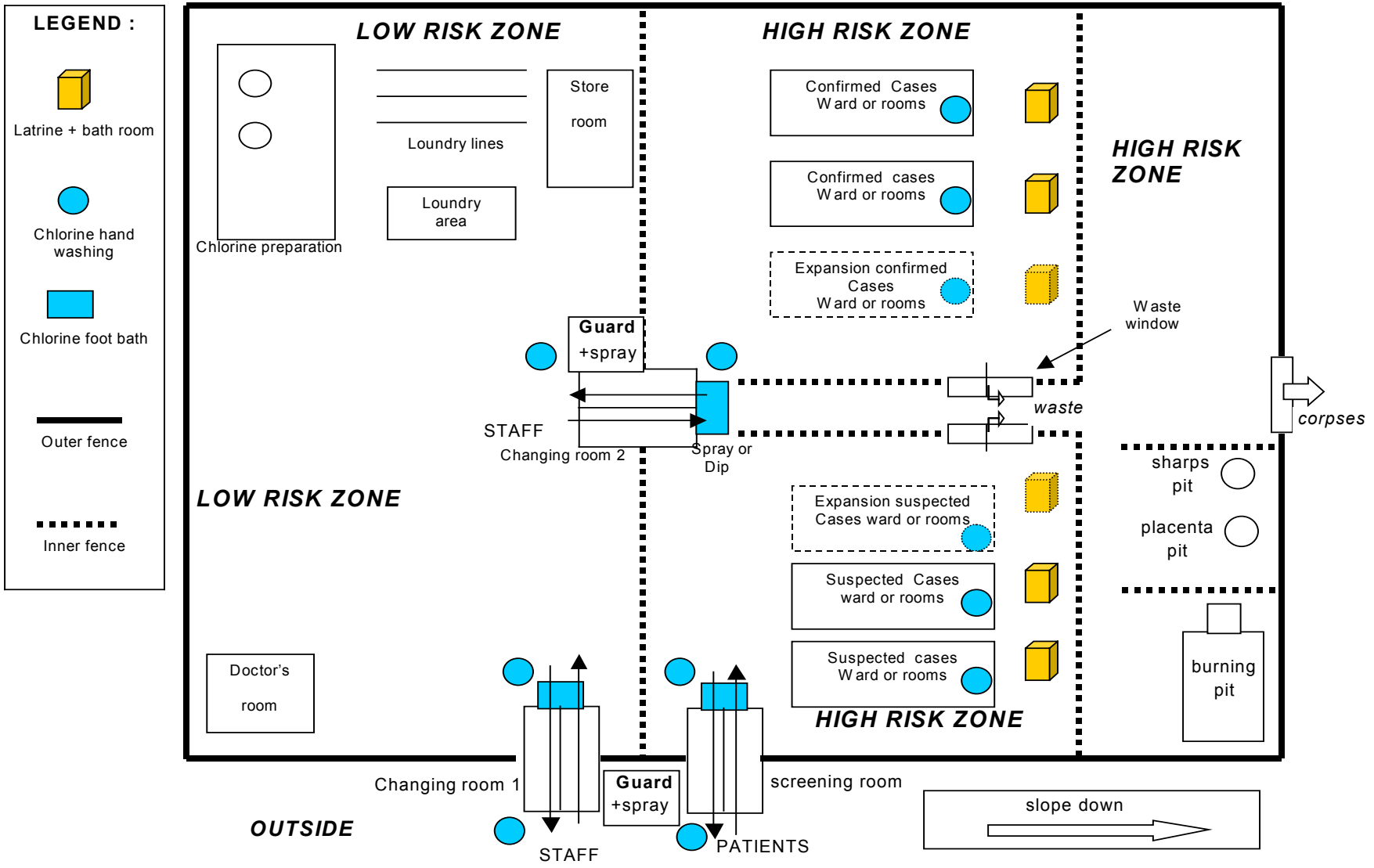
5. High-Risk Zone Facilities

Risk zone	Areas & activities	Facility	Location, space, quantity	Size	Recommended material Alternative material	Remarks
HIGH RISK ZONE	Suspected Cases	Holding area for suspected cases	One ward or individual rooms	Minimum 10m^2 per patient	Existing building Tent or plastic sheeting	The use of tents should be avoided (difficult infection control)
		Latrines for suspected cases	Less then 25m from ward or rooms. 1 for male, 1 for female 1 per 20 patients	Depth 2.5 m; 1.5m above water table	Plastic squatting slab Smooth concrete slab	Pit latrine advisable because it can not block (flush latrine can block)
		Bathrooms for suspected cases	Less then 25m from ward or rooms. 1 for male, 1 for female	2.5 m^2	Impervious, non-slip concrete with slope to drain	Connect to sewage system or soak away pit via grease trap
		Compound for suspected cases	Direct access from suspected cases' ward			Patients area in open air
	Confirmed Cases	Holding area confirmed cases	One ward or individual rooms	Minimal 10m^2 per patient	Existing building Tent or plastic sheeting	The use of tents should be avoided
		Latrines for confirmed cases	Less then 25m from ward or rooms. 1 for male, 1 for female 1 per 20 patients	Depth 2.5 m; 1.5m above water table	Plastic squatting slab Smooth concrete slab	Pit latrine advisable because it can not block (flush latrine can block)
		Compound for confirmed cases	Direct access from confirmed cases' ward			Patients area in open air
		Bathrooms for confirmed cases	Less then 25m from ward or rooms. 1 for male, 1 for female	2.5 m^2	Impervious, non-slip concrete with slope to drain	Connect to sewage system or soak away pit via grease trap
	Waste Zone	Burning pit	1 in waste zone, as far away as possible from patients, staff, laundry	2 x 2 x 2,5 m with burning platform	Local materials	See point B.5.d. on waste management
		Organic waste pit	1 in waste zone	1.5 x 1.5 m Depth 2m	Concrete roof slab with lockable cover	Used for organic waste: placentas, food, solid wet waste which is not combustible, etc.
		Sharps pit	1 in waste zone	2m^3	Concrete lined pit with roof slab and lockable cover	Could be combined with organic waste pit
	Corpses	Morgue	Easy access from patients area with large exit for ambulance	5 x 4 m	Existing building Tent or plastic sheeting (roof is required)	In most of the settings there will be no morgue, and the corpses will go directly to the burial ground. Floor should be easy to clean
SLUICE	Disinfection	Foot bath, hand washing and spraying location	1 between high-risk and low-risk zone	1.5 x 2.5m Foot bath: 80 x 80cm	Concrete or gravel floor with footbath of plastic sheeting	Should be full time staffed by a guard / sprayer; Adjacent to the changing room.

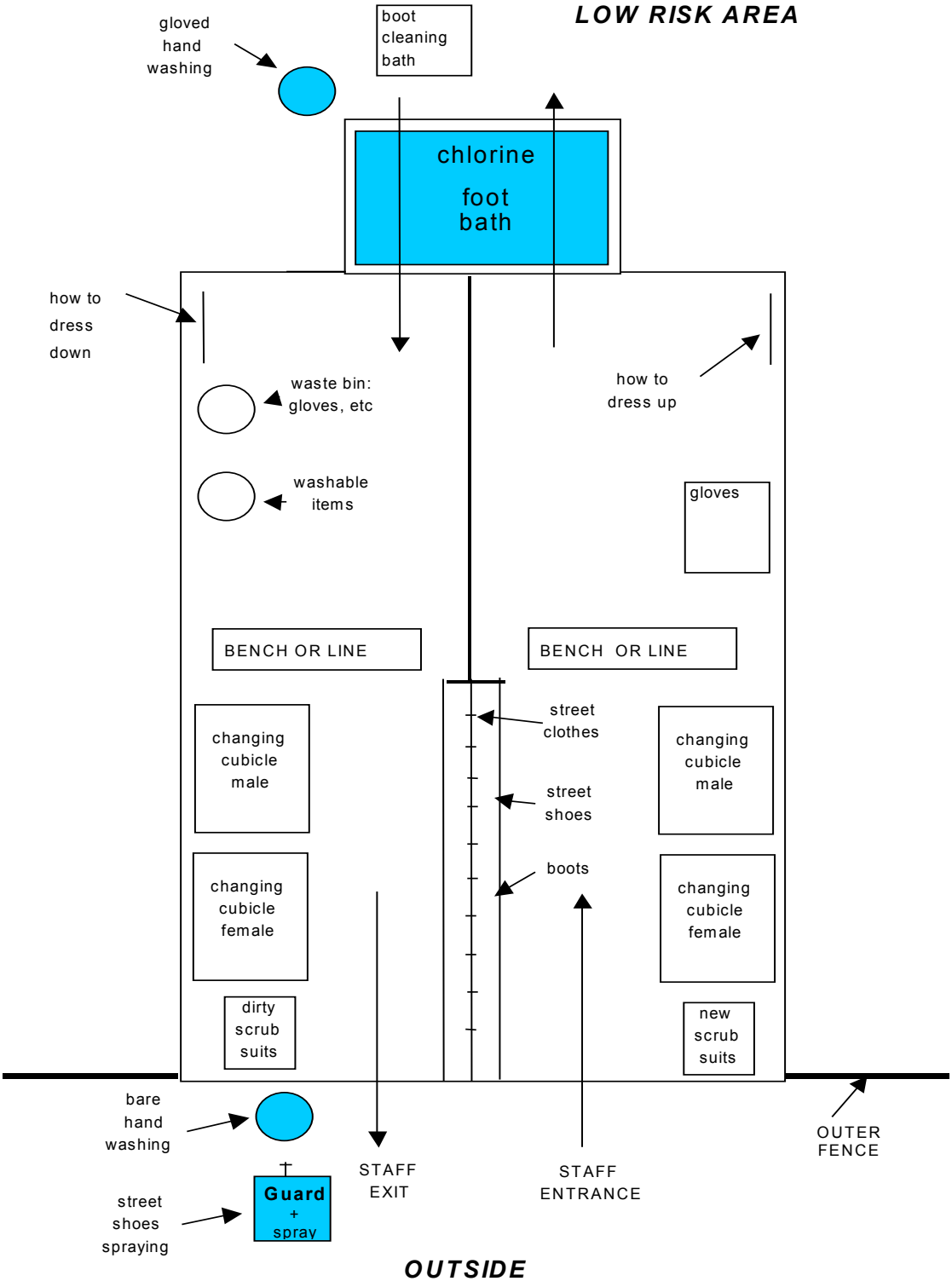
6. Low-Risk Zone Facilities

Risk zone	Areas & activities	Facility	Location, space, quantity	Size	Recommended material Alternative material	Remarks
SLUICE	Disinfection	Foot bath, hand washing and spraying location	1 between high-risk and low-risk zone	1.5 x 2.5m Foot bath: 80 x 80cm	Concrete or gravel floor with footbath of plastic sheeting	Should be staffed full time by a guard / sprayer; Adjacent to the changing room
LOW RISK ZONE	Putting on/off protective clothing	Changing room 1	At door between outside and low-risk zone	3 x 4m minimum	Existing building Tent or plastic sheeting	Separation between risk zones inside the changing room must be clearly indicated
		Changing room 2	At door between low-risk zone and high-risk zone	3 x 4m minimum	Existing building Tent or plastic sheeting	Separation between risk zone inside the changing room must be clearly indicated
	Disinfection	Chlorine preparation	Close to water point	3 x 4m minimum	Concrete slab Gravel bed	Must have good drainage into sewage system or soak away via grease trap Must be well-ventilated (chlorine gas is heavier than air)
	Administration	Doctor's room	1 room close to the patients area	3 x 4m minimum	Local building material	Must NOT be in High risk zone!
	Laundry Area	Laundry washing area	Away from burning site, adjacent to laundry lines and water point	Around 9m^2	Concrete slab	Connect to sewage system or soak away via grease trap
		Laundry drying area	Away from burning site, adjacent to laundry area	Around 15m^2	Wooden or iron poles, rope	Preferably in the sun (UV assists in destroying the Ebola virus).
	Security	Guard shack	Main entrance; Every exit from high-risk and low-risk zone.	4 m^2	Existing building Tent or plastic sheeting	
	Storage	Store room on compound	1 small store on compound for several days stock	3 x 4 m	Existing building Tent or plastic sheeting	
SLUICE	Disinfection	Foot bath, hand washing and spraying location	1 between outside and low risk zone	1.5 x 2.5m Foot bath: 80 x 80cm	Concrete or gravel floor with footbath of plastic sheeting	Should be full time staffed by a guard / sprayer, adjacent to the changing room.
OUTSIDE ISOLATION UNIT	Storage	General store room	1 outside isolation compound	8 x 4m	Existing building Tent or plastic sheeting	
	Kitchen	Kitchen for patients & possible attendants	1 outside the isolation compound	4 x 4m	Existing building or plastic sheeting	Respect protocols; See also point III E 1 b "Kitchen and food for patients & attendants"
	Staff room	Lunch room for staff	1 outside isolation compound			
	Staff toilet	Latrine	1 per 20 staff	2.5m^2	Plastic squatting slab Smooth concrete slab	

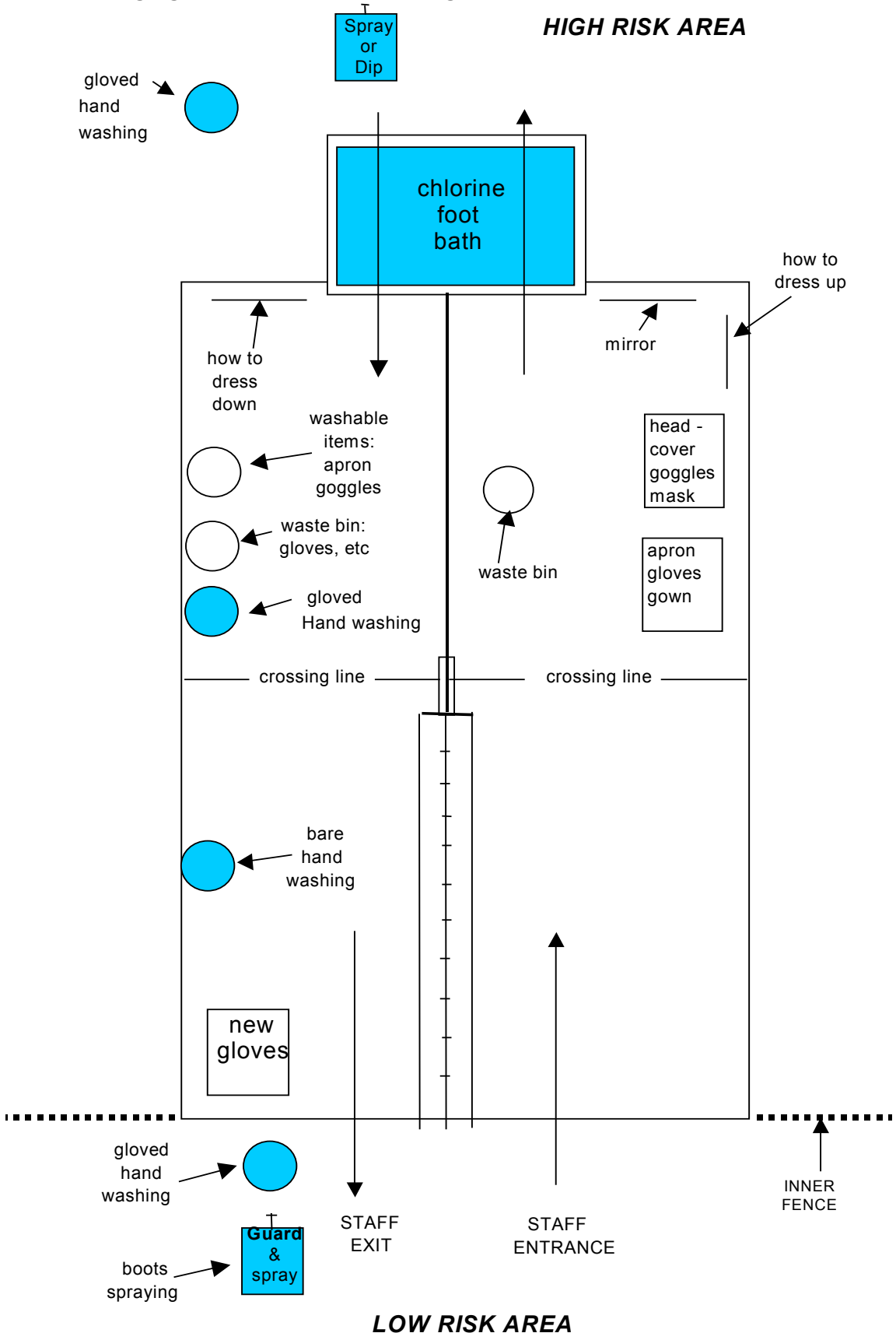
7. Plan of VHF Treatment Centre



8. Plan of Changing Room 1: From Outside to Low-Risk



9. Plan of Changing Room 2: Low-Risk to High-Risk



4. Organisation of isolation unit

Once the site is selected, and the site planning is done:

- Set up all facilities according to the plan;
- Equip all facilities with necessary equipment and material;
- Hire staff *(see also H.R. point III. F and job descriptions in annexes 26 to 33);*
- Train staff *(see also H.R. point III. F & annex 35);*

When everything is in place according to planning, and all necessary staff trained and able to work according protocols, the isolation unit should be a safe working environment now, and patients can be admitted.
See protocols in annexes 9 to 19.

- Continue on the job training;
- Continue constant monitoring by:
  - Hygiene (watsan) co-ordinator & Medical responsible;
  - Safety officer; *(See also point III.F.1.b.)*

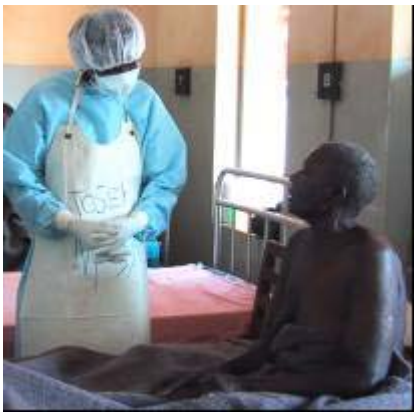
5. Barrier nursing – Infection control

Barrier nursing refers to introducing a barrier that will prevent transmission of disease from a infected person to a non-infected person. This barrier can take many forms and includes everything from wearing protective clothing to using an isolation room.

Infection control is the combination of all the measures to be taken and activities to be implemented to reduce the risk of infection.

Main objectives of **barrier nursing** and **infection control** is to prevent transmission of the virus:

- to medical & non-medical staff and patient attendants;
- to healthy (non-EHF) admitted suspected cases;
- to the wider hospital environment;
- to the general public;



UGANDA 2000 – Barrier nursing - Gulu Hospital.

a. Protective clothing

For each risk zone appropriate protective gear has to be worn:

In low risk zone: scrub suit, rubber boots and minimum 1 layer of gloves, and a second layer of household gloves depending on activities.

UGANDA 2000 – Sprayer in Masindi Hospital.

High-risk zone:

This is the Low risk zone protection completed with:

-Disposable gown;

-Plastic (or rubber) apron;

-Outer pair of gloves;

-High filtration mask;

-Head cover;

-Protective glasses (goggles);

1. Who ? Where ? Which Protection ?

Only persons who are trained in the use of protective gear, and with a valid (professional) reason should be allowed into the isolation unit. According to their job description, persons will be allowed only in the low risk area, or in both low and high risk areas.

Risk zone	Where	Facilities	Person allowed	Protective clothing
High Risk	Within the patients area and waste zone; Mortuary	• suspected cases • confirmed cases • latrines, baths for patients • waste zone • mortuary	• Patients • (Patient attendants) * • Inside cleaners • Nursing staff • Visitors (invited by in charge) • Person who handles waste (Waste zone only)	Rubber boots, scrub suit, double gloves, gown, apron, goggles, head cover and face mask
Low Risk	Inside isolation compound, but outside patients area and waste zone	• Chlorine preparation • Doctor's room • Changing room 2 • Laundry area	• All staff on duty • (Patient attendants) * • Officially invited visitors	Rubber boots, scrub suit and rubber gloves
	Outside isolation compound	• Changing room 1 • Kitchen for patients • Lunch room staff • Latrines for staff	All	

* *For more on patient attendants, see point III. B. 7. c.* Protective clothing and equipment needs to be **TRULY PROTECTIVE** and **COMFORTABLE** to wear for long periods without having to touch or adjust it!!! (especially goggles and masks).

CONSTANT MONITORING of the use of protective gear **is essential** during the whole outbreak**.**

-Are they being used ?

-Are they correctly used ?

-Are dressing- and undressing protocols respected ?

GOWNS:

Using reusable gowns in EHF isolation unit can increase risks of contamination.

GOGGLES:

For safety reasons, there needs to be **one individual (labelled) pair for each health worker** working in the high risk-zone in an isolation unit.

Must be completely protective (sides and top) and worn according the protocols, especially for close-to-patient work.

An anti-fog spray is useful.

RUBBER BOOTS:

For safety reasons, there needs to be **one individual pair marked with the name of each health worker** in an isolation unit.

A boot remover, as illustrated in picture under *point 2.2.* should be used to avoid touching your boots when undressing.

APRONS :

For safety reasons, aprons need to be **personal and marked with name**.

For more on Quality and requirements of protective equipment, ***see point III. E. 2. c.***

2. Dressing, undressing and changing rooms

DRESSING and UNDRESSING has to be done according to dressing procedures to prevent infectious material to come in contact with the human body. See annexes 12, 13, 14, 15 and 16.

CHANGING ROOMS

In the changing room staff will put on and take off their protective clothing.

Two changing rooms are necessary:

- changing room 1: from outside to low-risk zone to put on basic protective clothing;
- changing room 2: from low-risk to high-risk zone to complete to a full set of protective clothing.

The changing room needs to be **set up in a way** that:

1. **no cross contamination can take place**:
   - staff entering (clean) and staff leaving (potentially contaminated) should not interfere with each other;
   - contaminated material cannot contaminate 'clean' material.
2. staff are **aware** that they enter a zone with a **different risk level**:
   - route through the changing room is clear to staff;
   - the border between different risk zones is clearly indicated (e.g. red line or benches);
   - all protective clothing is available and easily accessible.

Personal and marked apron.

Boot remover and garbage stand in changing room 1

b. Physical barriers & movement limitation

Limit access to and within the isolation unit

- Put a fence around the isolation unit;
- Station a guard at the entry to the isolation unit;
- Make clear separations between the different risk zones inside the isolation unit;

Limit movement of people and material

- Make clear who is allowed in which risk zone and who is not;
- Limit the number of people working in high risk and low risk zones;
- Limit the time spent in every zone;
- Limit physical contact with patients and material;
- Limit the number of times people move between different risk zones;
- Never share material between the risk zones;
- Make sure that all persons and reusable material are being disinfected when going from a higher risk zone into a lower risk zone;
- Everything that comes from a higher risk zone into a lower risk zone must be considered as possible contaminated;

Monitor access and movement protocols!!

c. Disinfection

Disinfection can be done in several ways, depending on the availability of disinfectants, disinfection equipment and systems in place.
In a field setting, the easiest and most efficient way of disinfecting large surfaces, protective gear, waste etc, will be chemical disinfection.

1. Practical means to destroy Ebola virus

-Chemicals: Chlorine based products, alcohol, formaldehyde..

-Soap : Not only in isolation. Special attention must also be given to using soap as part of *general (universal) precautions* in the rest of the hospital and other health structures.

-Heat: Sterilisation, burning.

-Ultra Violet (UV) (sunshine)

UV from sunlight is active in destroying Ebola-virus;
Laundry can be hung in the sun for drying as extra disinfection;

2. Chlorine:

Chlorine is the main disinfectant used in EHF isolation. It's a universal disinfectant, easy to use, and active against all micro-organisms.

Which chlorine based products to use ?

Chlorine-based disinfectants gradually lose their strength.

→ use only chlorine from which you know the **origin**, which was **stocked** in good conditions (cool, without light), and from which you are sure of it's **expiry date**.

- **HTH 70% granules**:

Large amounts of chlorine solution are being used in an isolation unit. Only with HTH / NaDCC can these amounts be efficiently prepared.
When using HTH / NaDCC, verify it's origin, stocking conditions and expiry date.

- **Household bleach**:

The guideline "Infection control for VHF in the African health care setting (CDC/WHO)" recommends the use of household bleach products containing 5% active chlorine to prepare chlorine solutions. As bleach in the field is found in different strengths (3 to 5 or sometimes 8%) and quality is not guaranteed, **MSF recommends the use of HTH / NaDCC**.

Remarks:

While using chlorine, be aware:

- Spraying infected surfaces and corpses → **creating aerosols (wear mask, goggles)**
- Congealed or clotted blood is liquefied on contact with hypochlorites.
- Chlorine is irritant and corrosive.

3. How, what and where ?

Chlorine Solutions And Uses

Solution	Uses
0.5%	Disinfection of body fluids; Disinfection of corpses; Disinfection of toilets & bathrooms; Disinfection of gloved hands; Disinfection of floors; Disinfection of beds & mattress covers; Footbaths;
0.05%	Disinfection of bare hands and skin; Disinfection of medical equipment; Disinfection of laundry; Washing up of plates and eating utensils;

N.B. The above table recommends stronger chlorine solutions for certain uses than those given in the CDC/WHO VHF guidelines.

Applications of chlorine solutions

application:	**comments:**
Sprayer (20 litre chemical sprayer)	Not for dense material (stools, vomit); Not for very absorptive material (cotton); Care is required to avoid aerosolisation of infectious material; Sprayer must be of corrosive-free material.
Sprayer (1 litre hand-held)	Not for large areas; Care is required to avoid aerosolisation of infectious material; Not for dense material (stools, vomit); Not for very absorptive material (cotton);
Pouring by cup or bucket	Limit splashes;
Pouring from container with tap	Not for large areas;
Submersing	Not for large material (mattresses, etc);
Footbaths	Footbaths get dirty very quickly. Clean boots before entering chlorine bath in 'cleaning basins'. Also chlorinate these cleaning baths to prevent contamination.

Where ?

Chemical barriers

An obvious location for a chemical barrier is the **sluice** between the risk zones. This sluice serves two purposes:

- disinfection of potentially contaminated material (protective clothing, material, waste, etc);
- raising awareness of staff that they enter an area with a different risk level.

Disinfection equipment at sluice

1. Chlorine sprayer.

Contains 0.5% chlorine solution to spray boots, apron, gloved hands.

2. Foot baths.

Contains 0.5% chlorine solution.

Soil on the boots will weaken the chlorine in the footbath. To prevent the foot bath to becoming muddy, cleaning of boots has to be done prior to disinfection:

- Put a washing basin to clean the boots first before the real disinfection. Add 0.5% solution to prevent infectious material building up in the basin;
- Then place big foot bath for disinfection, with 0.5% chlorine solution;
- If necessary place a second cleaning basin for staff returning from patients area. Also add 0.5% solution.

Refresh all basins at least twice a day, or more frequently if necessary.

3. Hand washing

Part of the disinfection process is the chlorination of the gloved hands. Hand washing tap-stands at the sluices contain 0.5% chlorine solution for gloved hands, or 0.05% for bare hands. Rinse gloves or hands for **at least 10 seconds**.
Refresh the chlorine solution at least twice a day, or earlier when necessary.

Disinfection protocols and monitoring

All areas in isolation unit should be cleaned and disinfected according to disinfection protocols. An aid for infection-control monitoring is given in *annex 19 Infection control Check-list for Isolation ward.*

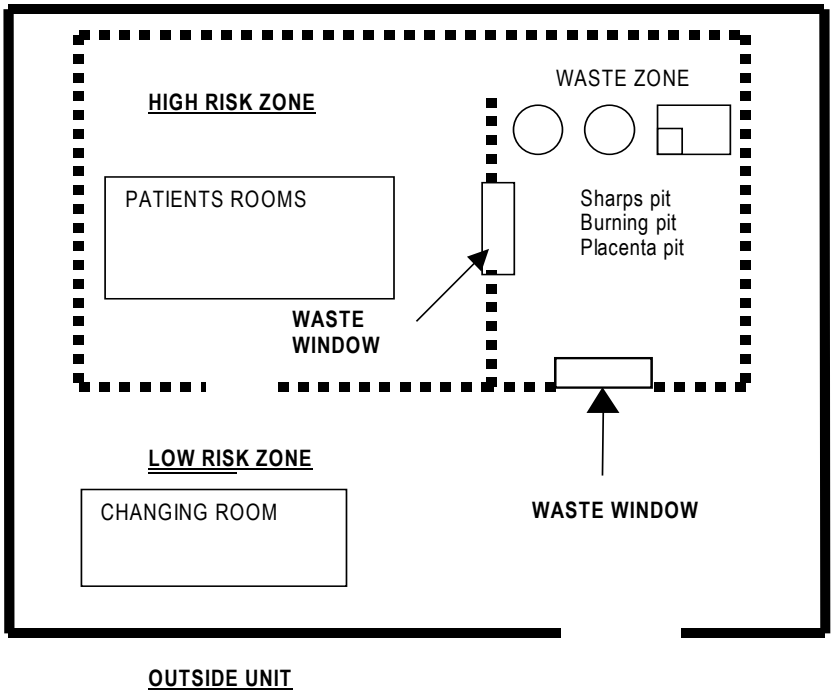
UGANDA 2000 - Hand-washing tap-stands in Gulu Hospital.

d. Waste management

All waste produced inside an isolation unit is potentially contaminated →**all waste must be securely collected, transported and disposed.**

Waste is produced in different forms and has to be dealt with in different ways.

Routing of waste

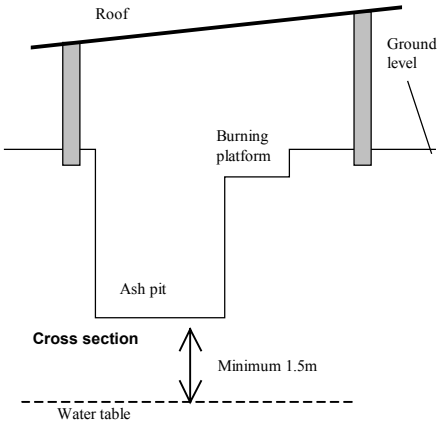


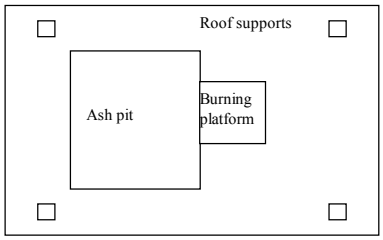
- Handle with extreme caution;
- To minimise the risk of contamination, transport to the waste zone as soon as possible.
- Waste windows or waste corridors are openings in the fencing to transport waste. Waste can be transported through these waste windows to avoid contaminating lower risk areas.
- No material should leave the patient's room, unless completely disinfected by spraying with or submersing in a 0.5% chlorine solution.

e. Different waste pits:

Cross Section And Plan Of Burning Pit

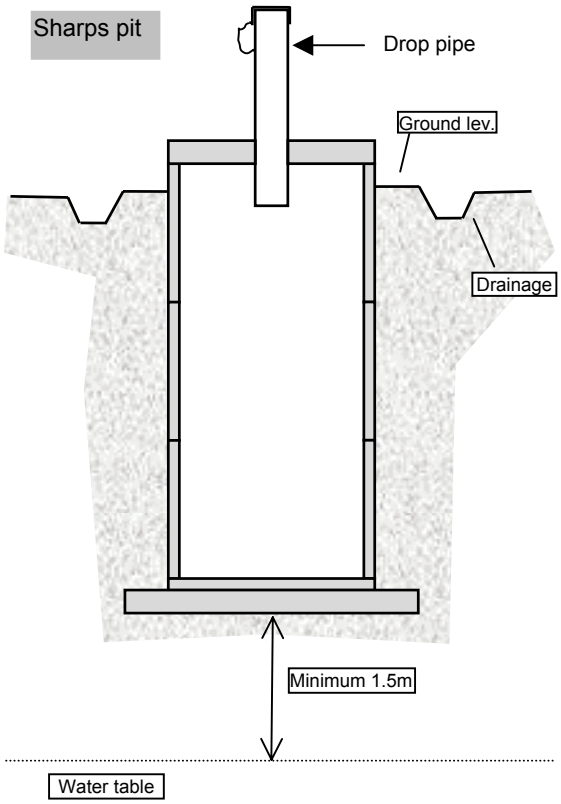
Simple pit excavated in earth, no lining.
Main pit 2 x 2 x 2.5m
Burning platform 0.5 x 0.5 x 0.5m



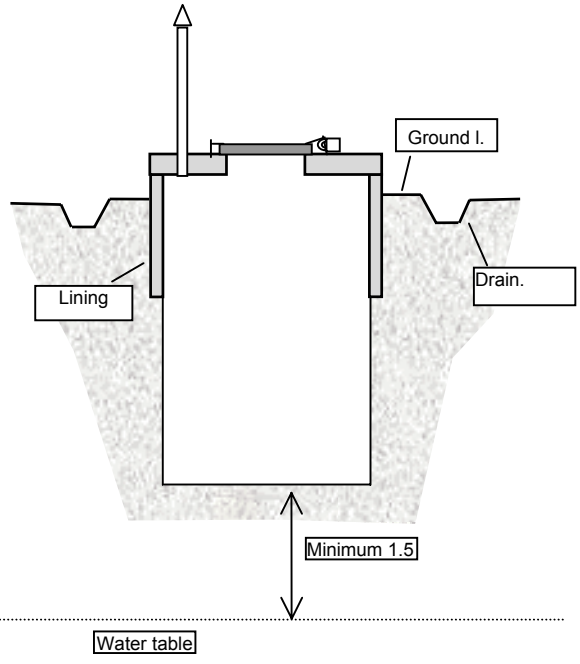


Plan

Sharps pit



Organic waste pit



Definition Of Waste & Recommendations For Collection, Transport, And Disposal

	Definition and examples	Collection	Transport	Disposal
Burn-able waste	**Dry waste** is all waste that has a low moisture content and is therefore easily combustible. Examples are: dressings, packaging, paper, used protective clothing (gowns, gloves, etc), plastic, syringes without needle, etc.	The bags should be supported in a garbage-bag-holder. When the double bag is ¾ full, collect it and close with a string or tape. Disinfect the outer bag. Put new double bags in the bin immediately. To reduce the risk of leaks, 2 bags, one inside the other, should be used to collect wet waste.	The waste worker must transport the bag(s) to the waste area. The bag(s) can be carried in a wheelbarrow to reduce the risk of the bag splitting and possible contamination of the compound.	Bags **must be burned** without opening them. Assist burning with paraffin where necessary.
	Wet waste is waste that has a high moisture content. In Isolation, this will often be contaminated waste that has been disinfected with chlorine (clothes, mattresses, etc).			
Liquid waste	All waste that can splash or spill is liquid waste. Examples are: body fluids: vomit, soft stools, urine, blood and wastewater (cleaning water, soiled chlorine solutions, etc). Body fluids can be excreted in two ways: 1. In a controlled way (into a bucket); 2. In an uncontrolled way (spills on floor, bed, clothes, etc).	1. Controlled spills: • Collect the waste in a bucket with 2 cm of 0.5% chlorine solution. • When waste has been excreted, add enough 0.5% solution to cover completely the waste • Allow minimum of 15 minutes for chlorine to act.	Transport the bucket to the latrine without splashing or spilling (lid). Do not transport it in the low-risk zone.	Liquid waste is best disposed of into a special **liquid waste pit or into a pit latrine**.
		2. Uncontrolled spills: • First rule: reduce the risk of uncontrolled splashes and spills; • Pour 0.5% solution directly on the spills without splashing; • Leave for 15 minutes; • Mop up with an absorptive pad or towel; • Place the waste into a bucket.		The soaked pads should be disposed of **into a pit latrine** (never into a flush latrine!), **or into the waste pit / burning pit**.
Organic waste	-Organic waste originating from the human body: placentas, body parts, etc. -Other organic waste e.g. food leftovers.	Organic waste originating from the human body introduces a huge biohazard and must be disposed of immediately. Organic waste can be collected in a double plastic bag supported by a garbage-bag-holder. Close the bags with a string or tape. Disinfect the outside of the bag.	The bags must be brought to the placenta pit (organic waste pit) or latrine.	Organic waste can be disposed of in a specially built **organic waste pit**. If such a pit is not available, dispose of into a pit latrine.
Waste water	-Run off water: rain water form the roof, or compound.	Avoid run off water to flow from higher into lower risk zones.	Direct wastewater to gutters, ideally lined with concrete.	Run off water and wastewater has to be controlled and directed to safe disposal areas. If wastewater is disposed of in a soak away, a grease trap should be installed. The grease trap must be disinfected before it's cleaned.
	-Wastewater: water used for cleaning, from foot baths, etc.	Wastewater has to be directed and collected into a soak away.		
Sharps	Items that can cause cuts or puncture wounds, including needles, scalpels, knives, infusion sets, saws, broken glass, nails, etc.	Sharps containers.	Disinfect outside of the sharps box before transporting. Fill inside with 0,5% chlorine solution before disposal.	Sharps pit.

Incinerating or burning

Burning or incinerating waste that is produced in the isolation unit has advantages:

- Destroys the virus if done properly (high enough temperatures);
- Reduces the volume;
- Makes most waste undesirable by (partly) destroying it;
- Is a controllable method of destruction (you know where and when);
- Can be done within the compound;

Burning in an open pit can have some advantages over incineration in an incinerator.

Disadvantages of incinerators:

Additional risky handling is introduced: storage of waste, and the collection, transport and disposal of ashes.
Existing incinerators are usually not inside the isolation area, so waste has to be transported outside the *high-risk zone*

Advantages of open burning:

Burning in an open pit reduces the handling, as the remains can simply be pushed into the ash pit with a stick.
An open burning pit can be built inside the isolation compound.

Burning pit (*see plan*)

Make a pit (min. 2 x 2 x 2,5 m deep) with an adjacent small platform (0.5m deep) to burn waste.

Fence off the pit. Construct a roof to protect pit from rain.

To assist burning, and reduce smoke nuisance to the operator, a simple iron sheet chimney can be built over the burning pit.

Push the ashes from the burning platform into the bigger waste pit. Cover ashes daily with earth.

6. Water and sanitation

a. Water Supply

Quantity

Per day around **300 to 400 litres water per patient** are required for an isolation with 10 admitted Ebola patients. In the same isolation unit, **a different number of patients will not change this figure significantly**, as consumption is mainly determined by the use for routine disinfection and cleaning purposes, and only a small proportion is used for drinking and preparing of ORS.

- Cleaning (with and without soap);
- Laundry (disinfection and rinsing);
- Chlorinated hand washing (strong and weak solutions) (0.5% and 0.05%);
- Chlorinated foot baths;
- Disinfection of material and bodies;
- Drinking and preparation of ORS;

Quality

For preparation of chlorine solutions the water should be clear. Turbidity should preferably be less than 5. In case that turbidity is >20, water treatment should take place to reduce turbidity prior to chlorination.
For disinfection of drinking water, residual free chlorine should be 0,4 mg/l at the tap.

Storage

Depending on the reliability of the water supply, an emergency buffer of water should be established or not. 15m3 storage would be more than adequate for most situations.

Distribution

Water is required everywhere in the isolation unit (drinking, disinfection, bathing, etc.).

Install a distribution system that supplies water throughout the unit, to prevent the need for manually transporting water and the consequent staff movement with additional risks involved.

All containers and distribution pipes should be made of plastic to avoid oxidation when in contact with chlorine solutions.

b. Sanitation

Latrines

The suspected cases ward and the confirmed cases ward must have separate latrines. In an existing construction the available latrines will probably have to be used. It may be worthwhile to build temporary simple pit latrines for the following reasons:

- Most convenient number and location of latrines can be chosen depending on the number of patients and layout of the isolation unit;
- The latrines and the excreta are kept within the compound (and are therefore controllable);
- Pit latrines cannot block (absorbent pads are frequently used and mis-disposed into latrines);
- After the outbreak pit latrines can easily be back filled (sceptic tanks and sewage are more difficult to control);

Pit latrines can be constructed with plastic emergency slabs or concrete pre-cast slabs. It is important that the slab can be easily cleaned and disinfected.
Pit must not be deeper than 2.5 meters (due to risk of collapsing). Bottom of pit must be more than 1.5 meter above groundwater level, to avoid risk of ground water contamination.

Minimum numbers of latrines is 1 latrine per 20 patients and preferably separate latrines for male and female.

Outside the isolation unit, at least two latrines must be available for staff (male and female).

Bathing facility

Suspect area and confirmed area must have separate bathing facilities. Facilities should be split for male and female users. The bathing facility must be easily to clean.

Laundry

Two types of laundry are handled in the isolation unit:

1. Protective clothing that has to be disinfected;
2. Bed linen and clothing of patients that has to be washed.

All protective clothing that has been used in the isolation compound (scrub suit, apron, goggles, etc) is potentially contaminated and must be disinfected. In the changing room, staff should deposit the used reusable protective clothing into a wide container containing 0.05% chlorine solution. The container is collected by the laundry-man and transported to the laundry area. Here the protective clothing is disinfected again in fresh 0.05% chlorine solution without using any detergent. After rinsing at least 2 times the laundry can be air-dried. Preferably dry in the sunlight, as this will allow some further disinfection (action of UV from the sun).

Bed linens and patient clothes must be collected in a wide container with 0.05% chlorine solution. Clothes of deceased patients must be treated as normal waste and must be burned.

Never mix chlorine with detergents or soap.

7. Case management

a. Priorities & safety levels in patient care

Clear safety levels must be implemented, with care delivered at a higher level only after the requirements of the lower levels are met.

○ Prevent nosocomial infections

The **highest priority** is the **protection of health care workers.**

The **next priority** is the **safety of the patient attendant** (family member at the patient's bedside) assisting with care of that patient.

Then comes the **welfare of other patients** in the isolation unit.

- **1 : PROTECT staff**
- **2 : PROTECT attendants**
- **3 : PROTECT other suspect patients**

If points 1, 2 and 3 are achieved and the environment of the isolation ward is safe for all in it, direct patient care can be addressed.

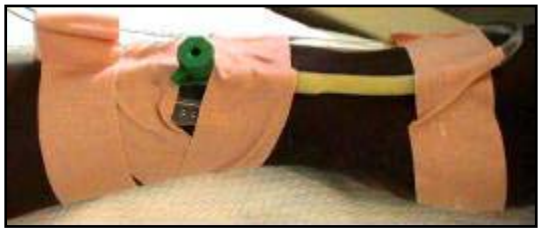
○ Treat patients

This begins with simple and relatively safe **oral therapy**; oral rehydration and oral pain medications, and actions like ensuring that ORS is virus free.

- **4** : **ORAL medication & oral rehydration**

If safety and benefits of levels 1 to 4 have been maximized for every staff member, care giver and patient, advancing to level 5 may be considered if extra requirements such as enough light when putting IV's at night, etc.. are fulfilled. Every intervention at this level carries a **cost of increased workload and exposure to staff**.

- **5** : **IV rehydration and other injection-related therapy**



Patients are often confused. Put only well secured IV lines.

The highest level of care would be intensive care.

- **6 : Intensive care**

b. Treatment - Brief Overview of Therapeutic Options

There is no specific treatment for Ebola Hemorrhagic Fever (EHF), therapeutic interventions are solely supportive, and there is no clear evidence that supportive measures make a significant impact on the course of the disease. However, patients should be given the benefit of the doubt and safe therapies initiated. Though it may not be possible to affect the course of the illness in all patients, some of their symptoms and suffering may be alleviated. Additionally, not all patients presenting with symptoms consistent with EHF will have the disease, and patients with other diseases (e.g. malaria, dysentery, etc.) may benefit from medical intervention.

Hydration – Ebola often has significant GI symptoms, and vomiting, anorexia, and diarrhea coupled with fever can lead to severe dehydration. Hypovolemia may worsen a patient's chances of recovering from Ebola.

- Oral rehydration – This is the safest and easiest method of rehydration. Patient factors (weakness, vomiting) may limit the extent to which this route may be used. ORS is preferable to free water.
    - Prepare a 5 L container of ORS for each patient each day and make sure that the patient and their attendant understand the importance of consuming as much as possible. Consumption should be monitored and recorded. Insufficient oral intake may be an indication for IV therapy in some patients

- IV rehydration – This is a risky maneuver in Ebola patients because of the need for a sharp needle on insertion and the possibility that the line may be pulled out by the patient with resultant contamination by blood of the surroundings. Any benefits of IV therapy must be weighed against the risk to health care staff posed by placement and maintenance of the line. In a patient that is able to take oral fluids, there is no benefit over oral rehydration to justify the risk. If the patient is so ill from Ebola that their weakness and prostration prevent them from taking oral fluids, there is no clear evidence that IV fluids will turn around their course.
  Ebola patients typically do not have the most severe form of dehydration (i.e. such as cholera patients), and their rehydration must proceed cautiously. In advanced Ebola there is also the risk that overaggressive IV hydration may result in pulmonary edema. Patients receiving IV hydration should be monitored for signs of overhydration (e.g. lung crepitus, engorged jugular veins, tachypnea). IV therapy remains controversial in Ebola, and if undertaken should be approached with caution.
    - IV's must be started safely under proper circumstances. The setup should be prepared in advance, there should be adequate lighting, proper patient positioning, and assistance available.
      IV fluids may be administered by bolus or continuous infusion:
        - If bolus therapy is used, one liter of Ringer's lactate for adults or 20cc/kg for children is given over 1-2 hours and the patient is reevaluated as to the need for further IV fluids. Some patients may be able to tolerate oral fluids after a few boluses.
        - For continuous infusion the rate is dependent upon the patient weight:
            - Adult (>40 kg): 40ml/kg/24hr
            - Children (20-40 kg): 60ml/kg/24hr
            - Children (10-20 kg): 80ml/kg/24hr
            - Infants (3-10 kg): 120ml/kg/24hr
            - Infants (<3kg): 140ml/kg/24hr

This rate may be adjusted based on the level of the volume deficit and patient response. Careful monitoring of therapy is important. IV therapy should be discontinued if signs of overhydration occur, the patient's condition persistently deteriorates an is likely irreversible, or the condition improves to the point where oral therapy is practical.

For further information on hydration, see MSF Clinical Guidelines section on Acute Diarrhea

- Control of emesis – Oral rehydration may be difficult in patients that are nauseated and vomiting. In these patients anti-emetic medications may facilitate oral rehydration and obviate the need for IV fluids. Oral medication is preferable to IM injections in patients whose vomiting is not severe enough to make PO medications impossible, as IM injections carry all the risks associated with sharps in the setting of Ebola. Patients with ileus have a mechanical etiology for their vomiting and are unlikely to respond to anti-emetic therapy.
    - Promethazine - adults: 25-50 mg PO q. 6hrs PRN
      (children 0.5mg/kg)
    - Metopamizine –

Pain control – The patient with Ebola frequently has severe headache and body pains. However little impact medical intervention has on the course of the disease, pain control is a blessing to all patients, regardless of their eventual outcome.

Mild pain:

- Paracetamol - adults: 1 g. PO q. 4-6 hrs PRN
  (children: 15 mg/kg)
- Propacetamol –

N.B. – In addition to treating mild pain paracetamol & propacetamol are antipyretics and should be the only medicines used to reduce fever. NSAID's are contraindicated in patients at risk of bleeding because of their inhibition of platelet aggregation. EHF induced hepatic dysfunction presents a theoretical problem with paracetamol/propacetamol , as it may interfere with detoxification of the hepatotoxic metabolites, so proper dosing is important.

Moderate pain:

- Tramadol – adult: 50-100 mg. PO/IM/slow IV q. 4-6 hrs PRN
  (do not use in children < 15 yrs).

Severe pain:

- Pentazocine – adult: 30-60 mg IM/IV q. 3-4 hrs PRN
  (children > 3 yrs: 0.5 mg/kg IV or 1 mg/kg IM)
- Morphine sublingual

Anti-microbials – Not only will antibiotics and antimalarials be of therapeutic use to patients presenting with some infections other than Ebola, but rapid response to these medicines may aid in diagnosis and facilitate in their discharge from the isolation ward. Depending on the dynamics of the outbreak, a significant number of patients in the isolation ward may have curable infections. Patients with Ebola may also have concurrent infections with locally common diseases (e.g. malaria) that can interfere with their ability to mount a response to Ebola. Empiric treatment with appropriate antibiotics and/or antimalarials should be considered in each patient.

See MSF clinical guidelines for treatment of specific infections:

Bacterial infections:

- Amoxicillin
- Chloramphenicol
- Doxycycline
- Metronidazole
- Cotrimoxizole
- Ciprofloxacin
- Ceftriaxone

Malaria:

- Artesunate
- Artemether
- Doxycycline

Chemical restraint/sedation – The confused and agitated patient in the isolation ward is a hazard to himself/herself, the staff, and the other patients. A patient wandering aimlessly through the ward may infect others or inadvertently become infected. As safety is the first priority in the isolation ward, liberal use of sedatives in confused or agitated patients is recommended.

If the patient is at all cooperative and can be reasoned with, oral medication is preferred. Frequently this is impossible and parenteral (IM/IV) treatment is required. Obviously, approaching an uncooperative patient with a sharp needle is very hazardous, should be done with greatest caution, with overwhelming manpower, and should not be attempted with violent patients except in direst emergency. If IV's are needed, their placement should not be attempted on unsedated patients; IM sedation should be administered and in effect prior to IV placement.

- Diazepam – adult: 10 mg IV q. 1-2 hrs PRN
  (children 0.3 mg/kg IV or 0.5 mg/kg PR)

N.B. – Diazepam has erratic uptake via IM and is not recommended for use by this route in this setting

- Chlorpromazine – adult: 25-50 mg IV/PO/IM TID PRN
  (children 0.5 mg/kg)

Anti-convulsants – Seizures in patients in the isolation ward may occur not only from Ebola, but meningitis and cerebral malaria as well. Seizing patients may injure themselves and bleed, pull IV's loose, or spray oral secretions, and are thus a potential hazard. The natural tendency to come to the aid of a seizing patient must be suppressed in the staff, as this involves unnecessary risk. Most seizures are self-limited and should be allowed to pass on their own.

The best therapy is preventative, and patients at risk for seizing may be given anti-convulsant medication (Phenobarbital) to suppress seizure activity. Medication to abort seizures (Diazepam) may be given if the seizure is prolonged (>10 min), an IV is in place, and the patient's seizure activity is mild enough that they can be approached safely. Non-medical precautions should also be implemented: pad any hard surfaces near the patient, place the patient a safe distance from other patients if possible, etc.

- Diazepam – adult: 10 mg IV q. 1-2 hrs PRN
  (children 0.3 mg/kg IV or 0.5 mg/kg PR)
- Phenobarbital – 5-7 mg/kg IM q. Day for seizure prophylaxis
  (for status epilepticus unresponsive to diazepam – adult: 10-15 mg/kg slow IV (<100mg/min); children 15-20 mg/kg)

Other measures

Given the limited effect of supportive therapy and the high mortality of EHF, some physicians may wish to attempt measures that have a theoretical potential benefit, but are as of yet unproven.

- Correcting hypokalemia – some data from the Gulu outbreak showed that patients with EHF had hypokalemia, and that there may be a correlation with disease severity and outcome with the potassium level. There is no established causal relationship, and correction of potassium deficit may have no impact on the course of the disease. Those wishing to use potassium supplementation should do so with caution.
    - Oral supplementation is usually quite safe, but may not be well tolerated in patients with pre-existing GI distress. Oral potassium supplementation is accomplished by using ORS with augmented potassium (ReSoMal).
    - IV potassium administration is a hazardous undertaking in settings where infusion rate control and cardiac monitoring are available – rarely the case in an Ebola isolation ward. In the setting of EHF it also carries with it all of the other hazards associated with IV fluids & medications. If attempted, a rate no faster than 10 miliequivalents per hour should be used – preferably much slower. One liter of Ringers lactate has 5 meq/liter, and adding 10 meq to each liter was the procedure used in the Gulu isolation ward.
- Correction of acidosis – Pre-terminal Ebola patients are profoundly tachypneic and are likely acidotic. This may be indicative of a general metabolic breakdown and efforts to correct it may be futile, but if correction is to be attempted, IV sodium bicarbonate is the treatment of choice.
    - Sodium bicarbonate 8.4%: 20ml slow IV or added to 1L of 5% dextrose for infusion
- Nutritional supplementation – Anorexia and vomiting in the Ebola patient may cause acute nutritional deficiencies which, on top of a chronic level of malnutrition, may cause difficulties in effective immune response to Ebola and other pathogens. However, feeding of Ebola patients must be done cautiously, as GI tract involvement may cause problems with absorption and ileus.
  Vitamin deficiency syndromes may compromise a patient's ability to respond appropriately to Ebola, and correction of any deficits may be beneficial.
    - Retinol (Vit. A) – children > 1 yr & adult: 200,000 IU PO q Day (on day 1, 2, & 8); children 6 mos. – 1 yr: 100,000 IU PO q Day (on day 1, 2, & 8)
    - Becozyme Forte (Vit. B complex) –
    - Ascorbic acid (Vit. C) – adult: 250-500 mg PO TID (children 125-250 mg)

Measures thought to be inefficacious: Corticosteroids, Vitamin K

Contraindicated: NSAID's (ASA, Ibuprofen, Indomethacin, etc.)

c. With attendants or not ?

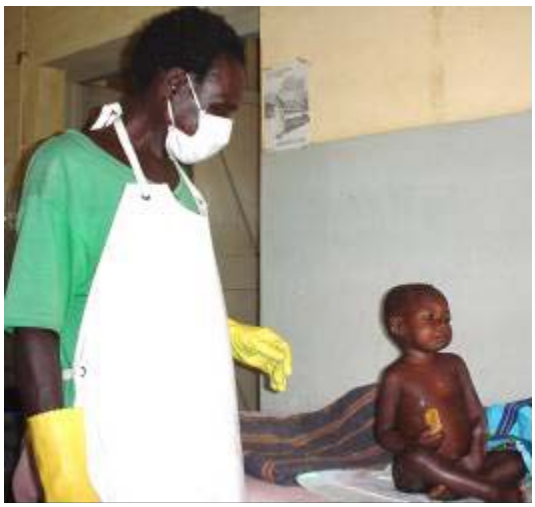
In almost all African settings family members deal with the day-to-day care for patients.

The decision on whether to allow non-medical caregivers (attendants) in the isolation unit will depend on possibilities and sufficient available staff. Both approaches have been used in previous outbreaks, but having those non-medical caregivers inside isolation must be avoided if possible (if enough staff available).

However, if non-medical caregivers are allowed, following points must be clear:

- **Only one relative** should be allowed and stay inside during entire hospitalisation period. He must be considered as a contact for 21 days from the moment he leaves the isolation unit.
- **Training on protective measures** and clothing must be given.
- **Training must be given on protocols** (hand washing, cleaning and use of chlorine solutions, importance of ORS, the use and purpose of different buckets and basins of patient, the importance of not sharing items with other caregivers or patients, restriction of movement, the no use of sharps(razors, glass objects..)) should be given.
- This training and supervision of caregivers should be **in the job-description** of one **clearly appointed person** per shift. This person should also be responsible of the distribution of the protective equipment as well as the recuperation of this equipment at end of stay of the attendant inside the isolation ward.

See example of job description for nurse in annex 29.



What about children and patient attendants ?

d. Mothers with children

Parents that have Ebola may infect their children.

Breastfed children: If the mother is admitted with symptoms, a breastfed child is probably already infected, but should be given the benefit of doubt → separation to a special paediatric isolation ward. (If baby stays at home, the chance of infecting an untrained caregiver is high.)
STOP breastfeeding, but continue stimulation of milk production & relieve breast "clogging".
(→ breast milk pump in MSF standard Ebola Haemorrhagic Fever Kit)

If the child becomes sick and Ag +, then he/she can be returned to the mother. If the child remains Ag -, then he is retested and can leave paediatric isolation ward after twenty-one days.

Older children: If already verbal and a-symptomatic → should stay at home and be recorded as contact.

Intermediate children: (pre-verbal, and less dependant than breast fed children) → should be isolated in paediatric isolation ward.

NOTE:

1. A paediatric isolation ward may be difficult to set up if resources are limited, especially during the early phases of the outbreak, but it should be a goal and taken into account when initial isolation ward set-up is considered.
2. Two breast pumps are for this purpose in the MSF standard Ebola Haemorrhagic Fever Kit.

EHF infected children - Paediatric isolation ward.

8. Closing down an isolation unit

At the end of the epidemic (no new cases for 42 days) there are **2 options** for closing the isolation unit:

1. **Return buildings and facilities to original state and use;**
2. **Retain as permanent isolation unit;**

The decision on how to close the isolation unit will be made in collaboration with the local medical authorities.
In all cases the compound, buildings, facilities, and equipment must be made safe.

If the **isolation unit is to be dismantled**, and the buildings and facilities returned to their former use, it is extremely important to ensure that all potentially contaminated material is destroyed, disinfected, or made inaccessible. Temporary structures, for example fencing, latrines and burning pits, must be dismantled and all pits backfilled.

Many materials and equipment can be re-used or recycled. Care is required to ensure that no materials leave the isolation unit until they are thoroughly disinfected.

If the **isolation unit is to be retained as a permanent isolation unit**, all potentially contaminated material must be destroyed, disinfected, or made inaccessible. Many structures within the isolation unit, for example fencing and latrines are temporary in nature, and as such will have a limited life.

The decision on which temporary structures to retain and which to dismantle should depend on the quality of the construction and the materials used. An isolation unit that deteriorates and becomes unusable within 6 months has little value.

Treatment of facilities and equipment when closing the isolation unit.

Item	Treatment	Remarks
Bed frames and hard furniture	Disinfection by spraying	Destroy if impossible to disinfect
Mattress covers	Burn or disinfection by immersion	
Mattresses	Burn	
Medical equipment	Disinfection	Destroy if impossible to disinfect (stethoscope, sphygmomanometer)
Wards and buildings	Disinfection of surfaces and walls by spraying	
Flush toilets	Disinfection of all surfaces by spraying	
Pit latrines	Disinfection of all surfaces by spraying	If temporary latrines – close & backfill
Bathrooms	Disinfection of all surfaces by spraying	
Grease traps	Disinfection by filling with 0,5% chlorine solution	
Vehicles	Disinfection by spraying	Must be rinsed after disinfection
Sharps pit	Encapsulate contents with concrete slurry	If permanent construction – can continue to be used after partial encapsulation
Organics pit	Encapsulate with concrete slurry	
Burning pit	Encapsulate with concrete slurry	

C. ACTIVITIES LINKED to Isolation Unit

1. Ambulance and burial teams

These teams **<u>are part of, and are coordinated by the surveillance-epidemiology team</u>**, and are in close contact with the isolation unit.

In small outbreaks, it's often the same team that does both transport of patients as well as burials. In bigger outbreaks, it will be different teams.

The teams should **<u>consist of 4 people</u>**:

- 2 people that handle the stretcher with patient or corpse in body bag;
- 1 spray man who carries out the disinfection;
- 1 driver of the car.

The cabin of the car should stay free of any contamination; therefore no other team members should be allowed in the cabin, and the driver should not come in contact with any infectious material.

A car, preferably a **pick-up**, should be available full time.

Ambulance and burial workers must **<u>receive training on</u>**:

- Dressing and undressing protocols;
- Protocols for safe transportation of patients;
- Disinfection procedures;
- Safe burial procedures;
- The reasons for strict burial procedures (they must be able to explain to families why this in-human way of burial is necessary);

The **<u>objective of safe burial</u>**

→ minimise infection risks for staff, family members of the deceased, and the local community while handling, transporting and burying the deceased.
All handling of corpses must be done with the greatest consideration and care; corpses with EHF are extremely infectious. Full protection is essential.

<u>Local Burial Beliefs, Habits and Practices</u>

All people have their own behaviour related to death. As corpses and body liquids are highly infectious, certain practices and rituals can introduce enormous risks for the people involved.

The burial team members must be well trained and supervised, and must be able to provide information and education to the communities involved. They must be able to withstand pressure from family members and the local community to change procedures that could result in unsafe practices.

Burial Procedures

1. Inform family of deceased to prepare the grave (by outreach or surveillance team).
2. Inform appropriate authorities (by hospital representative).
3. Disinfect corpse and place corpse in body bag (by burial team) (Ideally after collection of post-mortem sample, if this is necessary.)
4. Transport corpse outside patient's room (burial team).
5. Disinfect patient's room and material (inside cleaners).
6. Hold corpse in morgue if corpse cannot be transported immediately.
7. Transport to grave-site (burial team).
8. Burial (burial team).
9. Replenishing of stocks for burial team.

To limit the risks, the ideal would be to bury:

- Immediately after the patient has died;
- Closest possible of the isolation unit;
- Without family members intervening;
- With a specialised, full time burial team;

Due to family wishes, logistical problems and local community fears and resentments it will often be difficult to follow the ideal procedure. Compromises have to be made, but must never result in risky practices, whatever pressure from family or community may exist.

Graves

The grave must be at least 2 meters deep, taking in consideration that the bottom must be at least 1.5 meter above the ground water.
Graves must be marked with the persons name, date of death, etc.

The gravesite should be ideally situated in a location with limited access. This can be difficult to achieve. An existing graveyard can be used if a separate area has been identified. It is unclear how long a body will remain infectious after being placed in a grave, therefore the graves must be located in an area that is unlikely to be disturbed.

a. Guideline for Safe Burial Practices
b. Guide for Ambulance team
c. Checklist for supplies for Burial and Ambulance Teams

→ **See annexes 9 and 10.**

On-site training and monitoring of Gulu burial team.

2. Medical Outreach

1. Universal precautions and precautions to reduce VHF transmission in health facilities.

Most big outbreaks that have occurred in the past were related to nosocomial spread and amplification of the disease. It is unlikely that they would have been so big if simple measures such as **Universal precautions**, which should normally be in place in all health care facilities, had been routine practices at the onset of the epidemic (Yambuku, Kikwit, Gulu).

Additional to Universal precautions are the **precautions to reduce VHF transmission in health facilities.**

As a **priority, in the first phase** of the intervention, all health care services in the suspect area should be checked, and the use of universal precautions must be reinforced with the implementation of precautions to reduce VHF transmission in health facilities.

Training must be given, on:

- Universal precautions and VHF precautions;
- Case definition and recognition;
- Protective measures;

Once sure that staff understand the protection measures, and that precautions are implemented, a Health Centre Kit, as described in *point E.3.a* can be given.

If these criteria are not met, it can be **more dangerous to distribute this kit and give untrained health care workers a false sense of security** because of the protective equipment in it.

2. Laboratories, operation theatres, delivery rooms and morgues.

All this facilities are high risk sources of nosocomial transmission.

Laboratories should be closed until safe working practices can be guaranteed.
Activity in operation theatres must be minimised (Stop all non-urgent interventions), and measures to prevent VHF transmission implemented.

Measures to prevent VHF transmission must be implemented in delivery rooms. Traditional birth attendants must be trained.

3. Holding area in health care centres.

The health centre kit (*point E.3.a*) contains sufficient material to safely hold a suspect EHF-case while awaiting transfer to the isolation unit.

If health centre staff are not properly trained or equipped, it may be better to hold the suspect case in his own house while waiting for safe transport to the isolation unit..

For this situation, a “Household-kit” can be considered as developed in Kikwit (RDC 1995 outbreak). It contains supplies that are easy to use: a plastic basin, a water container, household gloves, disposable surgical masks and Chloramine tablets.

4. Peripheral health care facilities and passive case finding.

This is already described in the surveillance chapter, but it is an aspect that can be emphasized and improved with medical outreach. Recognition, safe screening and holding measures, can be greatly improved in most situations.

3. Sensitisation, Education & Information

This is an important issue in fighting an outbreak. Community awareness and accurate disease information can help to avoid possible infections linked to behaviour and traditional practices. It can also diminish many problems linked to stigmatisation.

Sensitisation, education & information channels:

- Mass information through radio, TV or other mass or individual media;
- Distribution of pamphlets or leaflets;
- Community mobilisation through mobile teams, trained local leaders and community volunteers;
- Information, education and sensitisation through participatory meetings (questions and answers).

D. ADJACENT AREAS

1. Preparedness of adjacent areas during an outbreak

During an outbreak, surrounding areas or countries should be prepared, but this **without becoming over-excited.**

Main issues to look at:

1. **Extra monitoring on possible suspect cases;**

→ Module 7 of MSF standard Ebola Haemorrhagic Fever Kit;

→ Training on Case definition and clinical identification;

2. **Improving (or implementation) of Universal Precautions;**

→ Training, reinforcement and implementation if not in place yet;

3. **Contingency plan;**

→ Identify appropriate locations for possible set up of isolation units;

→ Estimate possible needs. Check with your (MSF) supplier for availability and delivery delay of a standard MSF Ebola haemorrhagic fever kit, which can be ordered AFTER LABORATORY CONFIRMATION of a possible suspect case. This kit is on stand-by in Europe.

NOTE:

Know that the number of reports of (false) suspect cases, which are normally not reported, increases when there is an outbreak in an adjacent zone.

E. LOGISTICS

Logistic components will be the same for all outbreaks, but needs will depend on the size of the outbreak. Most of the specific logistical information can be found in each chapter. However, below is a summary of the main points:

1. General Logistic support

a. Epidemiology and surveillance

-**Central co-ordination base:**

Place from where the mobile-teams will be coordinated, and all information centralised.

Needs:

- Secure with sufficient space for computer equipment, communication systems and coordination meetings;
- Reliable power system;
- Well functioning communication base
  - Appropriate communication equipment (well set-up and right choice depending to the local situation);
  - Trained operator;
  - Clear information flow (forms, protocols);
- Central location;

-**Mobile surveillance teams:**

Those are the teams doing active case finding, contact tracing, social mobilisation & education.

Needs:

Depending on the distance of their working area, they will need:

- Transport;
- Communications: those working in distant places need to be able to contact or be contacted by the base;

-**Ambulance teams & Burial teams:**

Mobile teams, for (suspect) case transport.
Mobile teams, for death transport and burial.

Needs:

- Transport: Vehicle (preferably pick-up or ambulance with separation), which can be decontaminated with 0.5% chlorine solution;
- Ambulances should preferably be equipped with communication equipment; driver must be the only one to use it, and he must know how to use it safely (avoid infection via microphone)
- All necessarily protection material as listed in the **"Checklist for supplies for Burial and Ambulance Teams"** *See annex 10.*

b. Isolation:

- Set-up of isolation unit:

Needs:

This will be according to the situation on the ground, and defined after assessment and site planning with the medical and non-medical responsible. Most of the necessary items are included in the standard MSF Ebola Haemorrhagic Fever Kit

- Per admission:

Needs:

This is an example of a list of materials that must be available and ready next to the each patient's bed at admission.

Per patient:

1. Mattress covered with heavy duty plastic sheeting or PVC mattress cover
2. 1 bed sheet or blanket
3. 1 large blue plastic bucket for washing
4. 1 yellow bucket with lid for collecting liquid waste (vomit, spills…)
5. 1 green bucket with lid for the laundry
6. 1 plastic plate
7. 1 spoon
8. 1 large plastic cup for drinking
9. 1 jerry can of 5 l for drinking water or ORS
10. 1 soap

(11.1 roll of paper towel (to be re-supplied when necessary))

Additional items for confirmed cases:

1. Plastic bag suspended on end of the bed (to collect empty IV fluid bags as a record of IV fluid intake).
   !!! Instruct relatives, patient and cleaners not to use this for rubbish, needles or sharps.
2. Absorbent pad on bed in case of uncontrolled diarrhoea.

Additional items for attendants (if they are admitted):
Protective gear, blanket, plate, spoon, cub.

- Kitchen and food for patients & attendants:

The best way to provide food for the patients and possible attendants, is to have a central kitchen outside the isolation unit. Food is transferred from the kitchen cooking pots or containers into containers at the entrance of the isolation unit. The kitchen pots don't enter the isolation, and the isolation receptacles don't leave the isolation unit. While transferring food between kitchen and isolation pots, look out no contact between them occur, and even if no contact happens, disinfect kitchen pots before going back to kitchen.

c. Expat housing & EHF:

Additional to the standard rules and recommendations for expatriate housing and hygiene, some extra measures are required in an Ebola outbreak:

- People working inside the isolation unit in close contact with patients, need **enough rest of acceptable quality** → adequate sleeping facilities;
- It is compulsory to have **mosquito nets** installed and mosquito **repellent** available for all expatriates;
- A **hand washing** solution of 0,05% chlorine must be available in the house;
- A **basin** with daily renewed 0,05% chlorine solution must be available for soaking scrub suits or other potentially contaminated clothing of expatriates;
- Rodents and bats need to be controlled in the house;

d. MSF-Cars & EHF:

Additional to the usual rules for MSF-cars, the following must be applied:

- Each MSF-car must have on board:
  - One sprayer (1liter) with 0.05% solution for hand washing;
  - 2 kits of full protective gear;
- The **regular MSF-cars are NOT used as ambulances**;

  A car assigned as ambulance, is used for this purpose, and NOT for regular transport.

2. Consumables

a. Estimations of consumables for a 10 in-patient isolation unit and linked activities.

See also annex 21.

Disposable protection material	**Cons/day**
High-risk examination gloves (pairs)	180
Household gloves (pairs)	35
Surgical gloves (pairs)	50
Disposable surgical Gowns	100
Disposable Masks	120
Disposable Caps (head covers)	120

Diverse consumables	**Cons/day**
Garbage bags	30
Bed pads 60 x 60 cm	50
Water	3 to 4 m³
HTH 70%	7 kg
Body bags	Quantity depends on several factors such as virus strain (≠CFR), etc.

Reusable material	**Needs/10 days**
Scrub suit	90
Boots	45
Aprons	45
Goggles	120
Sprayers 12 l	4
Sprayers 1 l	10

b. Security stocks:

Running out of stock of just one of the protection items such as gowns, **can result in having to stop isolation activities.**

While calculating **buffer stocks**, take into account:

- Most of the protection material is **specific and non-MSF-standard**,

→ Non-standard orders can have longer delays than for standard items. Check with Transfer and/or logistic department while establishing buffer stocks.

- Buffer stock depends on **supply lines**, and availability. Local, International.

→ How long does it take to receive orders, taking account of possible delays at all levels (international, national, customs, transport etc).

→ Is your isolation unit part of a sub outbreak ? Is there a centrally organised supply stock ?

→ Are MOH and other intervening actors also supplying ? Co-ordinate with them.

→ If material is available locally, does it meet the quality requirements ?
For quality requirements, see point c.

- When ordering, take the content of the MSF standard Ebola kit into account.

- Water: 3 to 4 m³ consumption / day. If no regular and reliable water supply is available, install a buffer stock. → 15-m³ bladder will give 4 to 5 days security stock.

- Take account of contingency plans. Have enough material in case isolation has to be extended, or other sub-outbreaks would occur.

c. Quality and requirements for protective equipment

Protective gear needs to be **TRULY PROTECTIVE** and **COMFORTABLE** to wear for a long period without having to touch or adjust it under (often) tropical climate conditions!!!

Gloves:

Except for most tasks in the low risk area, two pairs of gloves are worn in isolation unit.

Requirements:

- Long enough (cover half of the forearm);
- Fit closely and securely on wrist and forearm (narrow and long);
- Strong;
- Allow the sensitivity required for certain activities (pulse taking);

Use:

High-risk examination gloves:
→ First pair for everybody.

Household gloves:
→ Second pair for heavy duty (burial, ambulance teams, sprayer, etc).

Surgical gloves:
→ Second pair for sensitive jobs (taking pulse..), the second pair can be surgical gloves.

Disposable surgical Gowns / Overall:

Requirements:

- Waterproof / hydrophobic;
- Long enough (should reach top of feet, but not drag on the ground);
- Completely covering the body, front and back;
- Long enough sleeves to reach wrists; with elasticised wrist bands;
- Well closed, with easy closings;
- There should be no pockets;

Three good types are:
A. Mao collar welded overall. Topguard ®; Tyvek-Pro.Tech ® -- NON STERILE
B. HARTMANN ® FOLIODRESS E ("special" or "perfect")
C. KLINIDRAPE ® Art nr 863402

Both Hartmann and Klinidrape should be standard XL and XXL (50% of each). Very short people can always cut a piece off the bottom so it doesn't drag the ground.

Disposable masks:

Requirements:

- Maximum surface covered;
- Masks wide enough to meet with head protection and goggles;
- High-filtration;
- Without expiratory valve;
- Waterproof / hydrophobic;
- Has to be comfortable to wear for a long period without having to readjust or touch it;
- Easy to put on and take off;

Disposable Caps (head covers):

Requirements:

- Max covering (neck also);
- Waterproof / hydrophobic;

Scrub suit:

Requirements:

- Easy to wear;
- Not too hot (light cotton);
- Without pockets;

Boots:

Requirements:

- Preferably bright color → identification;
- There needs to be one individual pair for each health worker in an isolation unit;
- Use boot remover, to avoid touching your boots when undressing;

Aprons:

Requirements:

- Long enough (cover boot extremities);
- Strong enough;
- Flexible and enclosing body;
- Bright color to be able to identify (personalise);
- Disinfectable light tarpaulin or strong plastic;

Goggles:

Requirements:

- Must be completely protective (side and top);
- Shielded air inlet → anti blur (use also anti-fog spray in kit);
- Easy & comfortable to wear;

Garbage bags:

Requirements:

- Strong;
- Easy closing;

Body bags:

Requirements:

- Strong and well closing;
- Long enough zipper tab → if too small, can be difficult to manipulate zipper with two pairs of gloves; (If long zipper tab not available, put little rope to tab before starting burial procedure.);
- Smooth zipper tab → to avoid damaging glove;

Sprayers:

Requirements:

- Corrosion free material;

For more on protective clothing, see also point III. B. 5. a.

3. Kits: Composition, Use and Logic behind them.

a. Health centre KIT (locally composed).

Use and logic behind it:

This kit is used to distribute to the Peripheral Health Care facilities during medical outreach. Before distributing, training has to be given, and health centre workers must understand the safety protocols for working with suspect Ebola cases.
If this is not the case, it can be **more dangerous to distribute this kit and give untrained health care workers a false sense of security** because of the protective equipment in it.

Composition: → ***See annex 22.***

b. Assessment KIT (locally composed).

Use and logic behind it:

This is a rapid field assessment kit. It was used during the Uganda outbreak, to assess **confirmed Ebola sub-outbreaks**. It can be used to set up a small isolation facility, and allows you to isolate and treat 2 to 3 patients during 3 days, while acquiring a better overview and initiating more orders according to the assessed situation.

Composition: → ***See annex 23.***

c. MSF standard Ebola Haemorrhagic Fever Kit.

Use and logic behind it:

This kit is designed to allow the set up of an isolation unit of 10 beds and to run it for 10 days. It contains all materials, protective equipment and drugs necessary to run the isolation unit, as well as the activities linked with the isolation unit, burial and ambulance teams and medical outreach.

The kit is on stand by in Brussels (Transfer), there is no need to stock this complete kit in the field for preparedness. A good option for preparedness in risk areas would be, to have available the sampling & Assessment module (module 7) of the kit, for identification of possible outbreaks. The complete MSF Ebola Haemorrhagic Fever Kit can then be ordered if an isolation has to be set up after lab confirmation of a positive case.

***Composition**:* The Kit consists of **7 modules**:

→ *See also annex 24 and 25 for detailed list of articles.*

Module 1 & 1 bis:	**Drugs.**
Module 2:	**Medical material.**
Module 3:	**Protection material.**
Module 4:	**Logistic & Sanitation.**
Module 5:	**Sampling.**
Module 6:	**Library, Forms and Stationary.**
Module 7:	**Sampling & assessment.** → can be ordered separately for **preparedness**.

Local purchase:

The kit is sent from Europe to **start and set up** an isolation unit, when having an outbreak (after lab confirmation).

More material can be ordered in bulk afterwards. If locally available, one has to be very **careful with the quality of especially the protective material**.

For more on quality requirements of protective material: see Point III. E. 2. c and III. B. 5. a.

Module 5 of the Kit contains sampling material to take and transport blood samples in vacutainers and on filter paper, skin-snip biopsy samples, liver biopsy samples and stool samples.

In this module, contrary to module 7, there is no extra material, protective equipment or disinfectants.

Module 7 (Sampling & assessment) of MSF standard Ebola Haemorrhagic Fever Kit

Use and logic behind it:

This module **can be ordered separately for preparedness**.

The module, allows a team to safely visit a site, assess a rumour of suspicion of VHF, and safely take, pack and transport samples. It includes all the necessary sampling, protection & disinfection material for two sample takers, and some extra protective material to install a small holding facility.

It can be useful to have this module in risk countries with many reports of suspected VHF, where it can be used for identification of possible outbreaks.

The complete Ebola Haemorrhagic Fever Kit can then be ordered if an isolation unit requires to be set up after lab. confirmation of a positive case.

For more on taking, conditioning and transporting of samples, ***see also point II. B. a.***

Composition: → ***See annex 25.***

F. HUMAN RESOURCES

1. General considerations:

a. Press & information officer (or contact person):

Ebola is still a « hot » disease and thus attractive for the media.

Relationship with the media are often very time consuming.
Sometimes difficult ethical and safety aspects arise (violating of safety barriers to try getting the most sensational pictures or story).

Due to those reasons, and the high interest of the media, which can be very time consuming, especially in the **early phase of bigger outbreaks,** the presence of a **press & information officer (or available contact person) is recommended.**

b. Safety officer:

A person, responsible for **safety related activities and infection prevention**, who has sufficient **authority** to oversee and implement all measures to be undertaken must be present.

Responsible for "**Environmental measures**":

- Deciding at which level (*see point III. B. 7. a. "Safety levels and priorities in case management"*) isolation ward is operating, and therefore what level of care may be delivered;
- Responsible for all safety related matters outside the isolation unit (burial and ambulance teams).

Responsible for the "**Human element**":

- Compliance with protocols;
- Training: adequate & routinely refreshed;
- Appropriate staff and adequate staffing levels during each shift;
- Looking for fatigue in workers;
- Alert for signs of complacency;

c. Psycho-social support:

Fear → feelings of fear in staff, and general fear within population.

Stigmatisation:

-all health workers:
  -in outbreak: local staff;
  -back home: expatriates;

-suspect, but non-confirmed cases → after discharge;

-convalescing discharged patients;

Traumatised:

- staff or family members → related to the loss of their colleagues or relatives.

2. Expatriate human resources:

a. Staffing needs

1. Early phase SET-UP:

A good SET-UP will contribute greatly towards a good day-to-day functioning.

It is **HIGHLY RECOMMENDED;** that both, the set-up of the management systems of an EHF outbreak, and the set up of an isolation ward, should be done by specialised, and preferably **VHF-experienced HR**. (Set up = One week to 10 days)

Setting up a well functioning isolation ward, should be done by a **VHF experienced medical- and a non-medical person**. The non-medical, should ideally be an **experienced watsan**, with good knowledge of **infection control**.

2. Day-to-day FUNCTIONING:

Once the set up is done and protocols are in place, it is advisable to have, especially inside an isolation ward, medical staff (MD & nurses) with theatre room, infectious disease or hospital hygiene experience, who are **used to all the procedures and reflexes needed for barrier nursing**.

The "watsan" day-to-day activities are related more to infection control then to conventional watsan. Some aspects could probably be done better by a nurse experienced in infection control, then by a watsan.

3. Missionary health structures and EHF

- If people are used trying to keep a system running on a small budget, reuse of disposable material is often seen.
- In an EHF outbreak, following barrier nursing protocols and rational thinking, often gives better protection than not following protocols and relying on Heavens protection.

b. Expat health: prevention, evacuation, post-mission follow-up

Prevention:

- Everyone working in an Ebola outbreak must realize, that the **stress engendered by the development of a fever in such a context**, is enormous. Therefore, **malaria prophylaxis** and the use **physical protection** (mosquito net, repellent) must be **COMPULSORY.**
- For the same reason, **strict hygiene measures** must be implemented **in the house** (kitchen, food, drinking water).
- Implement control measures against rodents & bats in the living space.
- Persons working inside the isolation ward should take a lunch break outside the hospital compound, to rest and change clothing.
- Persons working inside the isolation ward, should take at least one day off per week.

- **Take enough rest**, especially the people in close contact with Ebola. One uncontrolled movement when tired can be enough…→ oblige people to go on R & R (Rest & Recuperation) if necessary.

Uganda 2001 -- Log-co and H o M, & Babu on R & R at Murchisson falls (after outbreak).

Evacuation:

Two different scenarios:

1. Known incident with possible infection.
2. Sudden fever or haemorrhagic signs.

General recommendations:

- Expatriates must receive a clear briefing about the risks they take in working with Ebola. A clear expatriate health guideline must be written and explained to each expatriate.
- MSF cannot and must not give a 100% guarantee that anyone at risk or contracting the disease will be evacuated.
- The decision on whether to evacuate to another country should not only be that of the exposed person.
- In the beginning of the outbreak, MSF should identify one receiving isolation facility and transport option (e.g. SOS) to be used for all cases (not necessary your home country).

Post-mission follow-up:

- Extended medical insurance for at least 1 month after returning.
- No departure on a new mission for at least 21 days after return.
- For those living in another country outside Europe, with no MSF-identified isolation possibilities, compulsory stay in Europe for at least 21 days after return.
- Possibility for psycho social support.

3. Local human resources:

1. Job descriptions & protocols according to function

→ **See annexes 26 to 33.**

2. Recruitment

Finding people who are willing and able to work in the isolation unit is a problem due to fear, stigmatisation and the mystification of the disease. Many people are extremely scared of becoming infected.

3. One well defined team

It is important to have ONE WELL DEFINED team for the isolation unit, and not to have a rotation with, for example, the whole hospital staff.

4. Training, safety & supervision

A general training on the history, occurrence, treatment, barrier nursing & dangers should be given prior to hiring staff. After this training, people have the choice to be deployed or not.
When recruited, a more specific training has to be given, according to the job description.

Safety of staff is a top priority. Staff must understand all procedures and safety regulations before entering the isolation unit.

While running an isolation unit, it is very important to have a regular and continuous supervision of all the staff.
See also annexes 35 and 36 for examples of training modules..

5. Number of shifts

Achieving 3 full shifts in an isolation ward will probably be a "mission impossible", but if possible, having 4 shifts can reduce the pressure on the staff inside the isolation Unit.

6. Staffing needs for a 10beds / 50 beds Isolation Unit

	10 beds		50 beds	
Staff	**day**	**night**	**day**	**night**
Nurses	2	2	4	4
Doctor (supervisor)	1	(1)	2	1
MSF (or other Supervisor)	2	(1)	2	(1)
Safety officer	1	On call	1	On call
Ambulance team (per team)	4		4	
Burial team (per team)	4		4	
Hygiene coordinator	1	On call	1	On call
Guard / spray man	2	1	4	2
Chlorine preparation	1	-	2	-
Laundry man	2	-	2	-
Waste worker (collection, burning)	1	-	2	-
Inside cleaner	2-3	1-2	4-6	1-2
Outside cleaner	1	-	2	-

G. ETHICS

- Ethics and the media:

  Patient ←→ press looking for scoop at whatever price (without respecting the dignity of the patient).

- Ethics and science:

  Patient in service of science ←→ Science in service of patient.

- Ethics and barrier nursing:

  Dying on the other side of the barrier.

  Burial procedures ←→ burial uses and habits.

IV. REFERENCES / BIBLIOGRAPHY

1. MSF. Situation reports, Uganda outbreak 2000.

2. MSF. End of mission reports Uganda outbreak 2000.

3. MSF. E. Lodder, P Thomson. VHF Treatment Centre, Set-up, Installation and Management, derived from experiences in Uganda 2000 1st. Draft.

4. Ebola Outbreak in Gulu – Uganda; MSF/Epicentre B. Gergonne, F. Belanger, K. Leitmeyer

5. MSF. Proceedings Ebola Workshop Amsterdam march 15 and 16.

6. Dr. Simon Mardel. - Diagnosis and Treatment of Ebola, Lecture for Ebola Workshop Amsterdam march 15 and 16 February 2001.

7. WHO, Involved Coordination Organisations during Gulu outbreak. Protocol for Sustaining Epidemiological Surveillance of Ebola in Gulu District, Uganda; Draft 9/12/2000;

8. World Health Organisation. Guidelines for the safe transport of infectious substances and diagnostic specimens. 1997, 1-15.

9. World Health Organisation, Centers for Disease Control and Prevention. Barrier nursing handbook. 1-17.

10. World Health Organisation. WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola Haemorrhagic Fever. 1997; 1-37.

11. World Health Organisation, Centers for Disease Control and Prevention. Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting. 1998; 1-198.

12. World Health Organisation. Viral haemorrhagic Fevers – Fact sheets on Viral Haemorrhagic Fevers. www

13. Centers for Disease Control and Prevention. Disease Information - Viral Haemorrhagic Fevers – Fact sheets. www

14. Ethleen S. Lloyd, Sherif R. Zaki, P.E. Rollin, et al. Long-Term Disease Surveillance in Bandundu Region, DR Congo: A model for early detection and prevbention of Ebola Haemorrhagic Fever. J Infectious Diseases 1999; 179 (Suppl. 1) S274-280.

15. David L. Heymann ed al. Ebola Haemorrhagic Fever: Lessons from Kikwit, RD Congo. J Infectious Diseases 1999; 179 (Suppl. 1) S283-286

16. J.J. Muyembe et al. Ebola outbreak in Kikwit, DR Congo ; Discovery and Control Measures. J Infectious Diseases 1999; 179 (Suppl. 1) S259-262

17. B. Kerstiëns and F. Matthys. Intervention to control virus transmission during an outbreak of Ebola Haemorrhagic Fever: Experiences from Kikwit, Democratic Republic of the Congo, 1995. J Infectious Diseases 1999; 179 (Suppl. 1) S263-267

18. Y. Guimard, M. A. Bwaka et al. Organisation of Patient Care during the Ebola Haemorrhagic Fever Epidemic in Kikwit, Democratic Republic of the Congo, 1995. J Infectious Diseases 1999; 179 (Suppl. 1) S268-273.

19. C.J. Peters, J.W. LeDuc. An introduction to Ebola: The virus and the Disease. J Infectious Diseases 1999; 179 (Suppl. 1) ix-xvi.

20. Scott F. Dowell, Rose Mukunu, Thomas G. Ksiazek, Ali S. Khan, Pierre E. Rollin, and C.J. Peters, for the Commission de Lutte contre les Epidémies à Kikwit. Transmission of Ebola Haemorrhagic Fever: A study of Risk Factors in Family Members, Kikwit, Democratic Republic of congo, 1995. J Infectious Diseases 1999; 179 (Suppl. 1) S 87-91.

21. T.H. Roels, A.S. Bloom, J. Buffington, G.L. Muhungu, W.R. Mac Kenzie, A.S. Khan, R. Ndambi, D.L. Noach, H.R. Rolka, C.J. Peters, and T.G. Ksiazek. Ebola Haemorrhagic Fever, Kikwit, Democratic Republic of the Congo, 1995: Risk factors for Patients without reported exposure. J Infectious Diseases 1999; 179 (Suppl. 1) S92 – 97.

V. ANNEXES

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10. Checklist: Supplies for Burial and Ambulance Teams;
11. Site Selection Assessment Form For Health Centres;
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1. Main known Viral Haemorrhagic Fevers

Name	Geo. distribution	CFR	Modes of transmission
FILOVIRIDAE:			
• **Ebola HF (*1) (Ebola viruses)**	Africa, Philippines(*2)	50-80%	-Primate to man -Direct and indirect contact with patient's blood, or other body fluids -Close contact with patients
• **Marburg HF(*1) (Marburg virus)**	Africa	30%	-Primate to man -Direct and indirect contact with patient's blood, or other body fluids -Close contact with patients
BUNYAVIRIDAE:			
• **Crimean-Congo HF (*1) (Nairovirus)**	S. Europe, Asia, Africa, M. East	10-20%	- Tick-borne - Contact with infected animals' blood - Contact with patients' blood
• **Rift Valley fever (Rift valley fever virus)**	Africa	<1%	- Mosquito-borne
• **HF with renal syndrome (Hantaan & related virusses)**	Paleo-Arctic Possible worldwide	5-10%	- Rodent-borne - Aerosol (rodent to person) - Contact with infected rodents' excreta or secretions
FLAVIVIRIDAE:			
• **Yellow fever (Yellow fever virus)**	Africa, C. & S. Americas	50%	- Mosquito-borne (Aedes spp.)
• **Dengue HF**	Asia, Americas, Africa	<1%	-Mosquito
ARENAVIRIDAE:			
• **Lymphocytic choriomeningitis**	Worldwide	Rare	- Rodent-borne - Aerosol (rodent to person) - Contact with infected rodents' excreta or secretions
• **Lassa fever(*1) (Lassa fever virus)**	West-Africa	15-20%	-Rodent-borne -Aerosol (rodent to person) -Aerosol (person to person likely) -Contact with infected rodents' excreta -Contact with patient's blood, our other body fluids
• **Argentine HF (Junin virus) (*1)**	Argentina	30%	- Rodent-borne (Calomys), aerosol(rodent to person) - Aerosol?? - Contact with infected rodents' urine or secretions - Sexual contact with recovering patients
• **Brazilian HF (Sabia virus) (*1)**	Brazil	????	- Probably rodent-borne - Aerosol?? - Contact with infected rodents' urine or secretions
• **Venezuelan HF (Guanarito virus) (*1)**	Venezuela	30%	-Rodent-borne, aerosol(rodent to person) - Aerosol?? - Contact with infected rodents' urine or secretions
• **Bolivian HF (Machupo virus(*1)**	Bolivia	15-20%	- Rodent-borne (Calomys), aerosol(rodent to person) - Contact with infected rodents' exereta or secretions

(*1) : Barrier nursing techniques needed in taking care of patient;

(*2) : Philippines = EBO-R with human CFR 0%.

2. Summary of main Ebola outbreaks

Summary of main known Ebola outbreaks in chronological order						
Year	Place	Country	No. of cases	Perentage of death	Virus strain	Comments
1972	Tandala	Zaire	2		Ebola Zaire	Retrospective study
1976	Yambuku	Zaire	318	88%	Ebola Zaire	Nosocomial amplification
1976	Nzara, Maridi	Sudan	284	53%	Ebola Sudan	Nosocomial amplificaion
1976		England	1	0%	Ebola Sudan	Lab infection –needle stick
1977	Tandala	Zaire	1	100%	Ebola Zaire	
1979	Nzara	Sudan	34	65%	Ebola Sudan	
1989	Reston /Virginia	USA	0	0%	Ebola Reston	Monkeys imported from the Phillipines
1990	Virginia /Texas	USA	0	0%	Ebola Reston	Monkeys imported from the Phillipines
1992	Sienna	Italy	0	0%	Ebola Reston	Monkeys imported from the Phillipines
1994	Makokou, Minkebe	Gabon	44	63%	Ebola Zaire	
1994	Tai Forest	Ivory Coast	1	0%	Ebola Ivory Coast	Autopsy performed on chimpanzee
1995	Kikwit	Zaire	315	81%	Ebola Zaire	
	Mosango					Nosocomial amplification
1996	Mayibout area	Gabon	37	57%	Ebola Zaire	Dead chimp eaten by people-spread into family
1996	Boue area	Gabon	60	75%	Ebola Zaire	Index case was a hunter - dead chimp in the forest
1996		South Africa	2	50%	Ebola Zaire	Index was medical professional from Gabon, he infected caregiving nurse who died
1996	Alice,TX	USA	0	0%	Ebola Reston	Monkeys imported from the Phillipines
1996		Phillipines	0	0%	Ebola Reston	Monkey import facility in the Phillipines
2000	Gulu,	Uganda			Ebola Sudan	
	Masindi					

(Epicentre, march 2001)

3. Main Testing & Collaborating Centres on EHF.

Centers for Disease Control and Prevention (CDC)
National Center for Infectious Diseases
Division of Viral and Rickettsial Diseases,
Special Pathogens Branch
1600 Clifton Road, MS G-14
Atlanta, Georgia 30329-4018, USA
Tel. 00 1-404-639-1115
Fax 00 1-404-639-1118
Mail: CJP0@CDC.GOV

National Institute for Virology
Special Pathogens Unit
Private Bag X4
Sandringham 2131, Zaloska 4, South Africa
Tel. 00 27-11-882-9910
00 27-11-321-4200
Fax 00 27-11-882-0596
00 27-11-882-0596

US Army Medical Research Institute of Infectious Diseases (USAMRIID)
Fort Detrick, Maryland 21 702-5011
USA
Tel. 00 1 404 639 1115
Fax 00 1 404 639 1118

Division of Pathology
Centre for Applied Microbiology and research
Porton Down, Salisbury
Wiltshire SP4 0JG UK
Tel. 00 44 198 061 2224
Fax 00 44 198 061 2731

Institut Pasteur
28, rue du Dr Roux
75724 Paris Cedex 15
France
Tel. 00 33 1 406 13088
Fax 00 33 1 406 13151

Bernard-Nocht Institut

Bernhard-Nochtstrasse 74
D-20359 Hamburg 4,
Germany
Tel. 00 49 40 31 18 24 60
Fax 00 49 30 31 18 23 78

4. Main possible intervening international organisms in outbreak

- **WHO: Disease Surveillance and Control (DIS), Division of Emerging and other Communicable Diseases (EMC)**. *WHO, 20 avenue Appia, CH-1211 Geneva 27, Switzerland.*
  Tel. (41 22) 791 2109; Fax (41 22) 791 4893; E-mail: outbreakemc@who.ch

→ Co-ordination

* **MOH:** → Health authorities/Co-ordination

* **Center for Disease Control and Prevention (CDC), Atlanta, USA.** → Confirmation of outbreak, Lab-testing, possible field work (case management, ecologic field work).

* **National Institute for Virology, Special Pathogens Unit, South Africa**
* **Phillips-University Institute of Virology Marburg, Germany**
* **Institut Pasteur, Paris, France**
→ Confirmation of outbreak, Lab-testing, possible field work (case management, ecologic field work).

* **Institute of Tropical Medicine, Antwerp, Belgium**
→ Possible field work

5. Case and Contact definitions for Ebola Haemorrhagic Fever

(for use in the field)

ALERT DEFINITION (NOTIFY LOCAL HEALTH CENTER OR MOBILE TEAM):

- Any case of sudden onset of high fever **OR**
- Sudden death **OR**
- Bleeding or bloody diarrhoea or blood in urine

SUSPECTED CASE DEFINITION (REFER TO HOSPITAL):

All persons, living or deceased, with:

- contact* with a case of Ebola Haemorrhagic Fever ***and***
- fever

OR

- fever ***and***
- 3 or more of the following symptoms:
  - headache
  - vomiting
  - loss of appetite
  - diarrhoea
  - weakness or severe fatigue
  - abdominal pain
  - body aches or joint pains
  - difficulty in swallowing
  - difficulty in breathing
  - hiccoughs

OR

- Unexplained bleeding of any kind

OR

- Any unexplained death (complete forms and notify burial team)

A contact is any person who comes into contact with a case by

4. Sleeping in the same household within one month
5. Direct physical contact with the case (dead or alive)
6. Touching his/her linens or body fluids

6. Example of Case Reporting Form

Case # _____
(To be filled in by Surveillance Office)

Gulu Investigation: Case report form for Ebola Haemorrhagic Fever
(For All Suspected Cases)

Date of Interview ___/___/__ (DD/ MM/ YYYY)

District _____ Form completed by _____

I. IDENTIFICATION

Surname…….. Other Name ……..

Age (years) ..... Date of Birth __/__/____ Sex M/F Occupation .....

LC1 ..... Sub county ..... County .....

Head of household .....……

For hospitalised patients:
Date of admission __/__/____ Date of release __/__/____
D/M/ Y D/M/ Y

This case was initially identified by (circle one):

1. Community Alert System 2. Mobile Team 3. Presentation to hospital

II. CLINICAL CONDITION

Alive ..... Dead ..... If dead, date of death__/__/____
D/M/ Y

(*If performed, date of post-mortem skin biopsy__/__/____*)
D/M/ Y

Contact with another case? (circle one) Yes No Unknown

If yes:

Surname of Case..... Other Name of Case……

Case # ……

Relationship .....
Date of last contact __/__/___
D/M/ Y
Type of contact .....

If subject answers "yes" to both question, subject is a suspected case.

Fever? (circle one) Yes No Unknown
If yes, date of onset __/__/____
D/M/ Y

Case report form (page 2)

Does or did the patient have:

Headache	Yes	No
Vomiting/Nausea	Yes	No
Anorexia/Loss of Appetite	Yes	No
Diarrhoea	Yes	No
Intense Fatigue	Yes	No
Abdominal Pain	Yes	No
Muscle or Joint Pain	Yes	No
Difficulty Swallowing	Yes	No
Difficulty Breathing	Yes	No
Hiccoughs	Yes	No

If subject has a **fever** and answers "yes" to three or more questions, subject is a suspected case

Signs of Haemorrhage:

Bleeding Gums?	Yes	No
Bleeding into eyes?	Yes	No
Bleeding into skin?	Yes	No
Black or bloody stool?	Yes	No
Vomiting blood?	Yes	No
Nose bleeds?	Yes	No

If subject answers "yes" to any one of these questions, subject is a suspected case.

If subject is a SUSPECTED CASE, do the following:

1. Explain to the subject that they need to be transported to the hospital for further evaluation.
2. Contact the transport team to collect the patient.
3. Fill out **CONTACT RECORDING SHEET**.

TO BE COMPLETED ONLY AT SURVEILLANCE OFFICE:

Case Classification: (circle one)

Alert-case **Suspected** **Probable** **Lab-confirmed** **Not a case**

7. Example of Contact Recording Form

Contacts[1] Recording Sheet (filled in by ……)

Case's name ……..…….. Case's number (if assigned) …….

Case's Village …… LC1 chairman ……..

Sub - County …….. County ……

Hospitalised …. / Found in the community …. If Hospitalised, Hospital ……. Date of Admission ……..

Surname	Other Name	Relationship with the case	Age (yrs)	Sex (M/F)	Head of Household	Village	LC1 chairman	Sub-County	Type of Contact (1, 2 or3 list all)	Date of last contact	Last date for follow-up	1st Visit	Outcome

[1] **Contacts = 1 sleep in the same household within one month**
2 direct physical contacts with the case (dead or alive)
3 has touched his / her linens or body fluids

8. Example of Contact Tracing Form

Contact Tracing Form – by Village **Team …….** **Volunteer's name …….**

Village …… LC1 chairman …… Sub-County …… County ……

CN	Family Name	First Name	Age	Sex	Date of last contact	Day of Follow-up																		
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Tick " 0 " if the contact has not developed fever or bleeding
Tick " X " if the contact has died or developed fever or bleeding (complete case report form and, if alive, refer to the hospital)

9. Guideline for Safe Burial Practices; Guide for Ambulance team

Introduction: both ambulance teams and burial teams will receive similar training with regard to use of protective clothing. The ambulance team will keep their protective clothing until the patient is in the isolation unit and the car disinfected. The same group may function as both an ambulance team and a burial team.

Preparation of body:

- Spray the body and the area around body with 0.5% chlorine;
- Spray blanket thoroughly with chlorine;
- Place body on blanket and cover completely;
- Open body bag and spray inside;
- Place body and personal clothing inside body bag and close it securely;
- Spray outside of body bag with 0.5% chlorine;

Transport & burial

- Place body on stretcher (cover stretcher with plastic sheet if it is made of canvas);
- Place in vehicle and transport to gravesite;
- Place ropes on ground at 2 or 3 intervals to use to lower body into grave;
- If available place piece of plastic sheet on top of ropes;
- Place body on top of ropes/sheeting;
- 2 persons lower body by ropes into grave and drop ropes and sheeting in grave;
- Spray the stretcher thoroughly;
- Spray inside of vehicle with 0.5% chlorine and let stand at least 10 minutes;
- Spray gloves, apron, boots with chlorine;

Undressing

Undress only after being back in the isolation unit. If this is not possible:

- Remove protective clothing as per protocol;
- Spray goggles after removing them;
- Discard disposable material (gown, cap, mask) into grave. If this is not possible and grave is filled, place disposable material into plastic bag, spray with 0.5% chlorine and put in 2nd bag, close it. Spray. Transport to isolation unit waste disposal for burning by isolation unit personnel;
- Place re-usable materials in bucket (goggles, household gloves, apron) spray again and close lid;
- Wash hands with soap and 0.05% chlorine;
- Rinse inside of vehicle thoroughly with clean water;
- Place stretcher in vehicle;

Procedure for burial for patient dying at home from suspected Ebola

- Before giving protective materials, supervisor of burial team should enter the family compound to speak with responsible person in family;
- Explain burial procedure and provide information on Ebola transmission;
- Explain why the body must be buried safely and explain the procedure of disinfection of the body;
- Make sure grave is prepared, 2 meters deep;
- After removing the body from the house, spray the room in which the patient died as well as the patient's mattress. Advise the family to burn the mattress;

After burial or after picking up patient:

- Clean re-usable materials with 0.5% chlorine;
- Replenish used items;

For ambulance team: after picking up patient for transport to isolation unit

- Provide information of Ebola transmission to family: explain reason for referral to hospital;
- Spray room where patient was staying and advise family to burn clothes and bedclothes used by patient;
- Undress only when back in isolation unit.

10. Checklist: Supplies for Burial and Ambulance Teams

Verify the presence of all items listed in the following **checklist:**

1. Four full sets of protective clothing
    - 4 pairs of gum boots;
    - 4 plastic aprons;
    - 4 pair goggles;
    - 4 re-usable gowns;
    - 4 caps;
    - 8 masks (may use double mask);
    - 8 pair of surgical gloves (double glove);
    - 4 pair of household gloves;
    - one bucket with lid to hold re-useable items after use; **
    - one thermometer (ambulance team);

2. one 10 litre spraying machine filled with 0.5% chlorine solution;
3. one 1 litre hand-sprayer with 0.05% chlorine;
4. one vinyl stretcher;
5. 3 lengths of rope cut to 5 meters each;
6. 4 plastic bags;
7. 2 bars of hand soap;
8. burial (or ambulance) guideline and guideline for making chlorine solution if field preparation is necessary;
9. 1 kg HTH granules and 1 plastic tablespoon;
10. 1 plastic cup;
11. 1 10 litre jerry can filled with 10 litres of water for making additional 0.5% chlorine;

** for the ambulance team, the (yellow) bucket should be used to as an emergency waste receptacle for patient use en route. Any waste disposed in the bucket must be disinfected immediately with 0.5% chlorine which can be poured from the 10-litre sprayer into the bucket.

These items must be replaced immediately after use. The kits must always be ready to use.

11. Site Selection Assessment Form For Health Centres

Assessment / site selection				**Date**	**Observer:**
Name Health Centre				District	
Population served				# Patients	
Cases reported				Referred to	
Name clinical officer					
Name watsan officer					
	YES	**NO**	**N/A**	**Comments**	
Excreta disposal					
Type of latrine					
Walking distance					
# Latrines for patients?					
# Latrines for Ebola patients?					
# Latrines for staff?					
Separation Ebola latrines from other latrines?					
Technical state?					
Shared with community?					
Access for elderly, disabled, children?					
Anal cleansing material?					
Hand washing facility?					
Cover available/used?					
Flies seen?					
Possibility to enlarge # latrines?					
Water supply					
Type of supply?					
Walking distance?					
Pumping method?					
Quality of water?					
Technical state of system?					
Water supply in HC?					
Chlorination?					
Water in dry season?					
Protection measures?					
Used by villagers?					
Distance from latrine?					

	YES	NO	N/A	Comments
Waste disposal				
Type of facilities?				
Walking distance?				
Protective measures?				
Technical state?				
Segregation waste in HC?				
Collection of waste in HC?				
Disposed regularly?				
Proper disposal of sharps?				
Proper disposal of organic waste?				
Proper disposal of solid waste?				
Awareness Ebola waste?				
Health & hygiene promotion				
# Health promoters?				
Facilities/messages being promoted?				
Visible signs of promo?				
Campaign message put into practice?				
Appropriateness?				
Community participation?				
Awareness of Ebola?				
General				
Location?				
Management?				
Facility to host patient?				
Separation patients and Ebola patients?				
Ebola training received?				
State of building?				
State of inventory?				
Storage facility?				
Source of patients' food?				
General Ebola awareness?				
Bathing facility present?				
General impression?				

12. Dressing Protocol for Low-Risk Zone

When entering the low-risk zone, staff dress up in the changing room according to the following procedure:

1. Remove street shoes and street clothes;
2. Put on one pair of gloves;
3. Put on scrub suit and your marked rubber boots;
4. Go into the low-risk *zone;*

Undressing protocol for staff coming from *low-risk zone*

When leaving the low-risk zone, staff undress in the changing room according to the following procedure:

1. Walk through chlorine foot bath and allow 1 minute for chlorine to work;
2. Remove boots with a boot remover and put on shelves;
3. Remove pair of gloves and dispose into waste bin;
4. Remove scrub suit and dispose of into collection container for disinfection / washing;
5. Put on street shoes and street clothes;
6. Disinfect hands with 0.05% chlorine solution;
7. Have street shoes and hands sprayed with 0.05% chlorine solution when leaving the changing room;

13. Dressing Protocol for High-Risk Zone

Coming from the low-risk zone, staff are wearing:

- One layer of gloves.
- Scrub suit;
- Rubber boots;

When entering the high-risk zone, staff dress up in the changing room according to the following procedure:

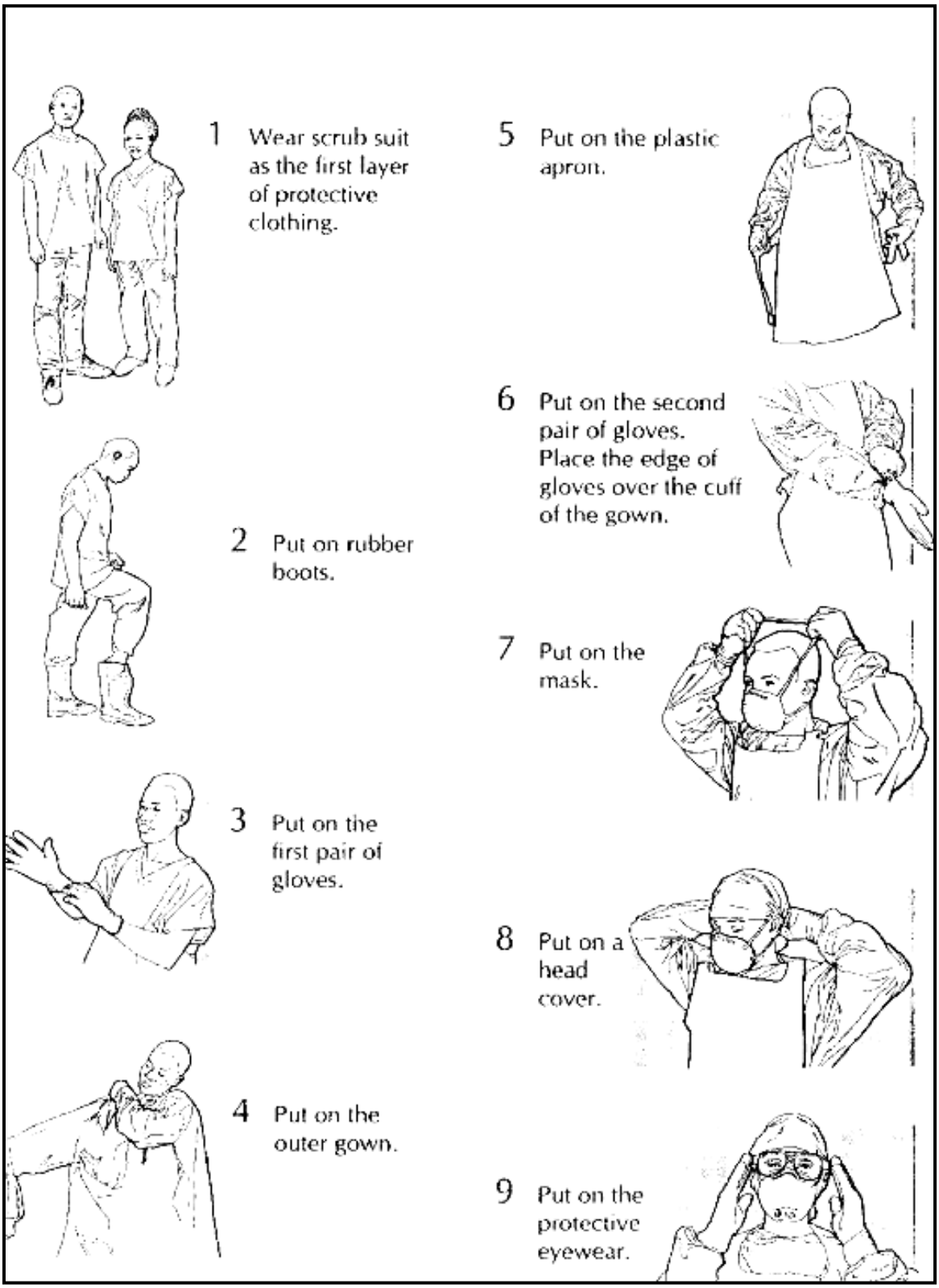
1. Put on the outer gown;
2. Put on the apron;
3. Put on a second layer of gloves (use talc powder to make it easier);
4. Put on the mask;
5. Put on the head cover;
6. Put on the goggles;
7. Go into the *high-risk zone.*

14. Undressing protocol for staff coming from *high-risk zone*

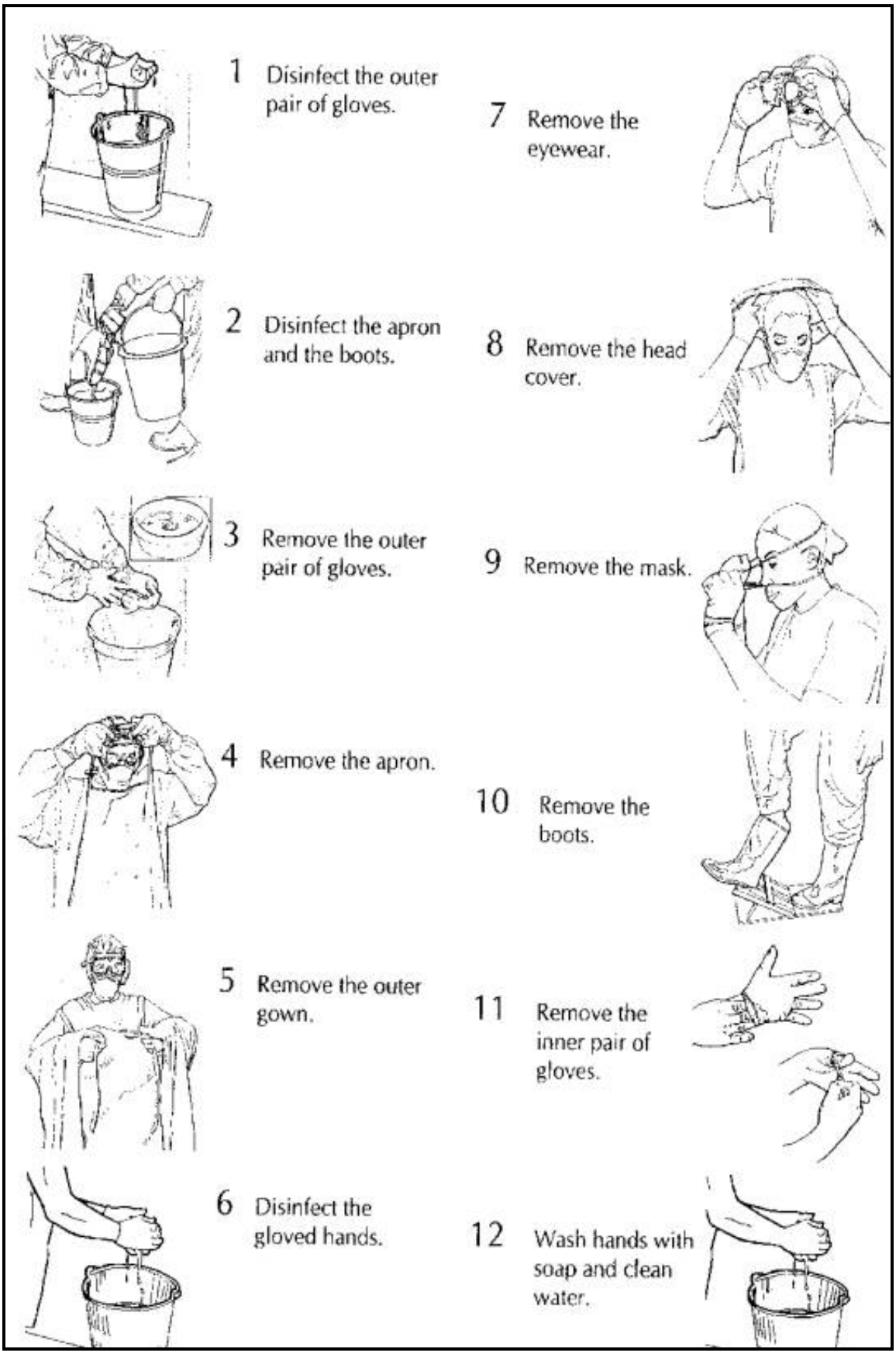
When leaving the high-risk zone, staff undress in the changing room according to the following procedure:

1. Have apron, boots and gloved hands sprayed with 0.5% chlorine solution;
2. Walk through chlorine foot bath and allow 1 minute for chlorine to work;
3. Wash you hands in hand washing basin with 0.5% chlorine solution;
4. Remove outer pair of gloves and dispose into waste bin;
5. Remove apron and dispose into bin with chlorine solution (will be rewashed);
6. Remove outer gown and dispose of into waste bin;
7. Disinfect (gloved) hands with 0.5% chlorine solution;
8. Remove goggles and dispose of into bin with 0.5% chlorine solution;
9. Remove head cover and dispose of into waste bin;
10. Remove mask and dispose of into waste bin;
11. Disinfect first layer of gloves with 0.5% chlorine solution or put on a new pair;
12. Go into *low-risk zone.*

15. Steps for Putting On Protective Clothing



16. Steps for taking off protective clothing



17. Preparation of 0.5% Chlorine Solution

CAUTION!

- Chlorine is a very aggressive and corrosive chemical.
- Always wear protective clothing when handling chlorine powder and solution.
- Prepare chlorine solutions in a well-ventilated area only, preferably in the open air.
- Use HTH 70% granulated chlorine.

Making 0.5% solution with chlorine powder HTH 70%

You need:

- HTH 70%;
- Plastic soup spoon (or stainless steel);
- Bucket of 10 litre;
- Jerry can with 10 litre clean water;
- Gloves, apron and rubber boots;

Preparation

- Wear boots, apron and gloves during preparation;
- Put 5 soup spoons of chlorine powder in the clean and empty 10 litre bucket;
- Add a table spoon of water;
- Make a paste out of chlorine and water, crush the granules as much as possible;
- When you have a smooth paste, add the rest of the 10 litre water;
- Stir well with a clean wooden stick;
- Let the sludge settle on the bottom of the bucket;
- Put the solutions in a jerry can (leave the sludge in the bucket) and write with a marker clearly on the outside: **CHLORINE SOLUTION 0.5%;**
- Dispose of the sludge into a sewage or soak-away;

Usage

- Always wear rubber boots, an apron, and gloves when handling 0.5% solution;
- Try not to splash;
- Be very careful with eyes and skin since the solution is very aggressive;
- When applied on metal objects (cars, etc) rinse at least 3 times with clean water;

Storage

- Store the solution in a cool and dark area in a closed plastic container, for example a jerry can or drum;
- Sunlight and heat weakens the solution;
- Solution should not be kept more then 24 hours;
- If solution is older then one day, dispose the solution in a drainage or latrine.

18. Procedure to Clean Isolation Ward After A Death

Objective

- The isolation ward is cleaned, disinfected, and made safe, following the death of a patient.
- All activities are carried out in a safe way for Staff and Patients.

Procedure

1. After the death of the patient the nurse in charge covers the body with a blanket;
2. The nurses will put a screen around the bed of the deceased patient;
3. The burial team will disinfect the body, put it in the body bag and will remove it from the isolation area;
4. Cleaners will enter the room with full protective clothing only;
5. Request other patients in the room/ward to leave the area if they are able to move;
6. Cleaners will remove mattress for burning in the case of heavy contamination;
7. Dirty mattress will be folded with some strings or cloths;
8. All remaining clothes and blankets will be put in a double plastic bag;
9. Mattress and bags with remains will be sprayed with 0.5% solution before transport;
10. The burner is informed that material has to be burned;
11. Cleaners will collect all material (possibly) used by the patient;
12. All personalized plastic cups, cutlery, plates, buckets are to be washed with 0.05% solution;
13. Bed, window, walls and the whole floor is disinfected with 0.5% chlorine solution by pouring with a cup or by spraying;
14. Put new mattress on the bed if necessary;
15. Remove screen from the bed;
16. Cleaners will remove all cleaning material;
17. When leaving cleaners will pass through the chlorine foot bath (1 minute) and will submerge their gloved hands in 0.5% for 1 minute;
18. Cleaners have their hands, apron and boots sprayed with 0.5% solution;
19. Inform the Nurse in charge that the ward has been cleaned;

19. Infection Control Checklist For Isolation Ward

Date :

Time :

Checked by :

Results being followed up by :

To be checked:	YES	NO	Comment:
Changing room 1 (outside to low-risk)			
Changing room organized and clean			
Changing room has sufficient stock of protective clothing			
Street clothing and shoes in 'clean' area only			
Used protective clothing in 'dirty' area only			
Basins to receive used clothing not overflowing			
Basins to receive used clothing have chlorine solution 0.05% (around 30cm)			
Waste basins not overflowing			
Guard / spray man present			
Sprayer and hand washing containers filled with appropriate chlorine solution			
No staff entering directly from high-risk zone			
No dirty clothes hanging over night			
Waste-water collection basin not full (hand washing)			
Sluice at changing room 1			
Foot bath refreshed at 9am			
Foot bath refreshed at 4pm			
Foot baths contain 0.5% chlorine solution			
Basin to clean boot are clean			
Basin to clean boot contains 0.5% chlorine solution			
Hand washing basins refreshed			Time:
Hand sprayer containing 0.05% available			
Hand sprayer containing 0.5% available			
Material used in high-risk zone is not passing sluice			
Changing room 2 (low-risk to high-risk)			
Changing room organized and clean			
Changing room has sufficient stock of protective clothing			
Used protective clothing in 'dirty' area only			
Basins to receive used clothing not overflowing			
Basins to receive used clothing contain chlorine solution 0.05% (around 30cm)			
Waste basins not overflowing			
Guard / spray man present			
Sprayer and hand washing containers filled with appropriate chlorine solution			
No dirty clothes hanging over night			
Waste-water collection basin not full (hand washing)			
Sluice at changing room 2			
Foot bath refreshed at 9am			
Foot bath refreshed at 4pm			
Foot baths contain 0.5% chlorine solution			

To be checked:	YES	NO	Comment:
Basin to clean boot are clean			
Basin to clean boot contains 0.5% chlorine solution			
Hand washing basins refreshed			Time:
Hand sprayer containing 0.05% available			
Hand sprayer containing 0.5% available			
Material used in high-risk zone is not passing through sluice			
Chlorine preparation			
Sufficient quantity of solutions available (at all times)			
Strength of solution 0.05% (5 spoons per 100 litre)			
Strength of solution 0.5% (50 spoons per 100 litre)			
Chlorine making area clean and organized			
Laundry			
Clothes, blankets are soaked in 0.05% overnight			
Collection of laundry according to regulations in job description			
Aprons, goggles, laundry soaked for minimum 1 hour in 0.05% solution			
Laundry lines are cleared of dried laundry			
Waste management			
Waste collector is wearing full protective clothing			
No full waste bins present			
No accumulation of waste in patients' area			
Waste is collected and transported in plastic bags			
Waste collected from patients area			
Waste windows are being used			
Waste corridor (for Confirmed ward) is being used			
Burning is done at least once a day			Time of burning:
Protective clothing			
Boots and gloves worn in LOW-RISK area			
People in HIGH-RISK zone wear full protection			
People do not touch their face in HIGH-RISK zone			
Hygiene behaviour			
Staff spray when leaving HIGH-RISK zone: Gloves: Apron: Boots:			
Staff wash their gloved hands leaving HIGH-RISK zone			In 0.5% hand basin
Staff being sprayed when leaving HIGH-RISK zone			
No staff from HIGH-RISK zone in changing room 1			
No staff from HIGH-RISK zone in Doctor's room			
No staff in HIGH-RISK zone touch their head			Or other unsafe practice

20. Clinical data form

Pt. Name…….. PT id nr……. Onset of illness ……./…../……

HOSPITAL DAY:	1 (Admit)	2		4	5	6	7	8	9	10	11		13	14
DATE:														
VITAL SIGNS:														
Temperature														
Pulse														
Respiratory Rate														
Blood pressure														
SYMPTOMS:														
Asthenia	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Anorexia	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Headache	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Abdominal pain	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Diarrhoea	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Nausea/Vomiting	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Sore throat	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Arthralgia/myalgia	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Back pain	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Chest pain	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Cough	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Dyspnea	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Anuria	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
NON-BLEEDING SIGNS:														
Head: Conjunctival injection	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Skin: Rash	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Pulmonary: Rales/rhonchi	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Cardiovascular: Edema	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
G.I.: Abdominal tenderness	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hepatomegaly	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Splenomegaly	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Right upper quart tenderness	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Neuro: Disorientation	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hiccups	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Pregnancy:	Y € N €													
BLEEDING SIGNS:														
Gums	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Epistaxis	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Bloody stools	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hematemesis	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Injection sites	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hematoma	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
Hemoptysis	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N
CLINICAL REMARKS:														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
Date: ___/___/___														
THERAPY:														
Oral rehydration														
ORS														
Plain water														
Oral drugs														
IV Fluid														
EBOLA TEST:	Date: ___/___/___ Positive □ neg □													
PATIENT OUTCOME:	Discharged alive (date): ___/___/___													

21. Utilisation & logic behind protection equipment in Ebola Kit

	Number of staff present per shift	Number of Shifts		Scrub suit**		Boots*		High risk examination gloves(pairs)		House hold gloves(pairs)		Surgical gloves(pairs)	
			Total nb. of persons involved in the unit	Nb of changes per shift	TOTAL	Nb of changes per shift	**TOTAL**	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL
Nurses	2	3		1	**6**	1	**6**		**24**	0	**0**	3	**18**
Safety Officer***	1	3	1	1	**1**	1	**1**	4	**12**	1	**3**	1	**3**
Doctor	1	3		1	**3**	1	**3**	4	**12**	0	**0**	3	**9**
Consultants	2	2	4	1	**4**	1	**4**	4	**16**	0	**0**	3	**12**
Burial team*****	3	2	3	1	**3**	1	**3**	2	**6**	1	**3**	0	**0**
Ambulance team*****	3	2	3	1	**3**	1	**3**	2	**6**	1	**3**	0	**0**
Hygiene coordinator	1	2	2	1	**2**	1	**2**	4	**8**	1	**2**	2	**4**
Inside Cleaners	2	3	6	1	**6**	1	**6**	4	**24**	1	**6**	0	**0**
Waste man	1	2	2	1	**2**	1	**2**	4	**8**	1	**2**	0	**0**
Family****	3	3	9	1	**9**	1	**9**	4	**36**	1	**9**	0	**0**
Low risk	2	1	2		**2**	1	**2**		**8**	1	**2**	0	**0**
Guards/sprayer High-risk	2	1	2	1	**2**	1	**2**	4	**8**	1	**2**	0	**0**
Laundry	1	1	1	1	**1**	1	**1**	4	**4**	1	**1**	0	**0**
Outside Cleaners	1	1	1	1	**1**	1	**1**	4	**4**	1	**1**	0	**0**
Total					45		45		176		34		46
For 10 days					90		45		1760		340		460
security 10%					99		50		1936		374		506
In the kit					**100**		**50**		**2000**		**400**		**1000**

	Number of staff present per shift	Number of Shifts		Gowns		Aprons*		Masks, prot,resp.		Caps		Goggles*	
			Total nb. of persons involved in the unit	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL	Nb of changes per shift	TOTAL
Nurses	2	3	6	3	**18**	1	**6**	3	**18**	3	**18**	1	**6**
Safety Officer***	1	3	1	2	**2**	1	**1**	2	**2**	2	**2**	1	**1**
Doctor	1	3	3	3	**9**		**3**	3	**9**	3		1	**3**
Consultants	2	2	4	3		1		3		3	**12**	1	**4**
team*****	3	2	3		**6**	1	**3**	2		2	**6**		**3**
Ambulance team*****		2		2	**6**	1		2	**6**	2	**6**	1	**3**
coordinator	1		2	1		1	**2**	3	**6**	3		1	**2**
Cleaners	2	3		3	**18**	1		3	**18**	3		1	**6**
Waste man	1	2	2		**6**	1	**2**	3	**6**	3	**6**	1	**2**
Family****	3	3	9	1	**9**	1	**9**		**27**	3	**27**	1	**9**
Guards/sprayer Low-risk	2	1	2	2		1	**2**	3	**6**	3	**6**	1	**2**
Guards/sprayer High-risk	2	1	2		**0**		**2**	0	**0**	0	**0**	0	**0**
Laundry	1	1		2	**2**	1	**1**	0	**0**	0	**0**	1	**1**
Outside Cleaners	1	1	1	0	**0**	0	**0**	0	**0**	0	**0**	0	**0**
Total					94		44		116		116		42
For 10 days					940		44		1160		1160		126
security 10%					1034		48		1276		1276		139
In the kit					**1036**		**50**		**1300**		**1300**		**150**

NOTES:

The consumptions are based on ideal situation (enough staff), and can thus differ in reality.

Number of changes per shifts = number of times that people go from lower risk to higher risk.

*: Personal material - people write their name on it. Material can be re-used after proper disinfection.

**: Must be changed/disinfected/washed between each shift.

***: One safety officer on-call 24h/24h.

****: Best solution is to forbid them the entrance of the high-risk zone. If impossible, they must be protected as the high-risk staff.

*****: Burial team: Assumption is one team of 3 people who will enter the high risk zone and/or be in close contact with highly contaminated people 2 times in a day.

22. Health Centre KIT (Locally composed)

USE:
This kit was distributed (Uganda 2000 outbreak) to the Peripheral Health Care facilities during medical outreach. Before distributing, training has to be given, and health centre workers need to know and understand the safety protocols for working with suspect Ebola cases.
If this is not the case, it can be **more dangerous to distribute this kit and give untrained health care workers the false sense of safety** because of the protection equipment in it.

COMPOSITION (Uganda):

The composition given in this annex is the one used in the Uganda 2000 outbreak. It can be changed according to the needs of the field.

Description	**Quantity**
20 litre bucket with cover	2
commercial chlorine solution	1 bottle
disposable latex gloves, medium	1 box of 100
plastic apron	1
gum boots	2 pair
household gloves	2 pair
disposable mask	10
goggles	1
plastic sheet 2 x 2 meters for covering mattress	2
laundry soap bars	2
plastic garbage bags	5
plastic basin for hand washing after consultation	1
body bags	2
chlorine sprayer of 1 litre capacity	1
Instruction sheets	
universal precautions	1
case definition of Ebola	1
preparation of chlorine solutions	1
sterilisation procedure	1
use of chlorine solutions in VHF	1

23. Assessment KIT (locally composed)

USE:
This is a rapid field assessment kit. It was used during the Uganda 2000 outbreak, to **assess sub-outbreaks (Ebola confirmed)**. It can be used to set up a little isolation facility, and allows you to isolate and treat 3 patients during 2 days.

The composition given in this annex is the one used in the Uganda 2000 outbreak. It can be changed according to the needs of the field.

COMPOSITION (Uganda):

No.	Protective Materials & medical supplies	Amount	Packed
1	Disposable gloves: medium	200	
2	Disposable gloves: large	200	
3	Disposable gowns:	50	
4	Surgical gloves: sterile size 7.5	100	
5.	Household gloves: pairs	20	
6	Disposable caps	100	
7.	Disposable masks	100	
8	Plastic goggles	20	
9	Long heavy plastic or rubber apron	20	
10	Cotton blouse	6	
11	Cotton trousers	6	
12	Gum boots sizes 39, 40, 41, 42	4 each	
13	Gum boot sizes 43, 44	4 each	
14	Stethoscope	1	
15	Plastic bags for medications	50	
16	Iodine 200 ml	1	
17	Thermometer	3	
18	Sphygmomanometer	1	
19	Tourniquet	1	
20	IV placement unit 18G	10	
21	IV placement unit 22G	10	
22	Ringers lactate: l liter	12	
23	IV giving sets	12	
24	ORS sachets	50	
25	Amoxycillin caps 250 mg	50	
26	Ciprofloxacin 250 mg	40	
27	Chloroquin 150mg base	50	
28	Paracetamol 500 mg tabs	50	
29	Paracetamol 100 mg tabs	50	
30	Diazepam 5mg/ml in 2 ml vials	5	
31	Metoclopramide 10mg tab	25	
32	Needles 19G	10	
33	Syringe 2ml	10	
34	Syringe 5 ml	10	
35	Syringe 10 ml	10	
36	Tongue depressors	10	
37	50% glucose: 50 ml	4	
	Other supplies: wat/san, disinfection		
38	HTH 70% 1kg	5	
39	Buckets: 20liters with lid, plastic	6	
40	Basin for hand washing, patient needs	6	
41	Rope ball	1	

42	Body bags	10	
43	Mattress covers	2	
44	Jerry cans, plastic 20 liters	4	
45	Jerry cans, 5 liters	3	
46	Plastic sheeting, roll	1	
47	Water containers 125 liters	2	
48	Plastic waste disposal bags	20	
49	Plastic tablespoons	5	
50	Soap, bars	10	
51	Sparadrap: 2.5 cm x 5 m	1	
52	10 liter sprayer	2	
53	1 liter sprayer	2	
54	Pool tester	1	
55	Paper towels rolls	3	
56	Disposable bed pads 60 x 60 cm	25	
	Books, stationery		
57	Essential drugs 1999	1	
58	Clinical guidelines 1999	1	
59	CDC VHF manual	1	
60	WHO VHF manual	1	
61	Instruction materials, 3 copies each form	20 sets	
62	Donation forms	10	
63	Patient hospitalization forms	10	
64	Case definition forms	20	
65	Surveillance case report forms	5	
66	Plastic envelopes for forms	30	
67	Hardcover registration books	3	
68	Pens	10	
69	Block notes	5	

Note: protective materials are for staff for 2-3 patients x 2 days:

1 nurse x 3 shifts: 6 sets of protective clothing and 1 pair gum boots
1 cleaner x 3 shifts: 6 sets of protective clothing and 1 pair gum boots
3 members of burial team x 1 internment: 3 sets of clothing and 3 pairs of gum boots
1 driver and 3 ambulance attendants: x 1 ambulance call: 4 sets of clothing and 4 pairs of gum boots
1 guard x 3 shifts = 3 guards: 3 pair of gumboots and 3 pair of household gloves
1 caregiver per patient x 2 patients: 2 pair of gum boots, 2 aprons, 2 household gloves and 4 masks
2 MSF team members

24. MSF Standard Ebola Haemorrhagic Fever Kit

	MSF CODE	DESCRIPTION	QTY	REMARKS / USE OF

1. KMEDMEBO1-- MODULE MEDICAMENTS; MODULE DRUGS.

1	DEXTIODP1S2	IODE POVIDONE, 10%, solution, 200 ml, fl. Verseur; IODINE POVIDONE, 10%, solution, 200 ml, dropper bot.	**5**	Antiseptic and disinfectant (medical use)	
2	DEXTCHLC1S1	CHLORHEXIDINE 1,5% + CETRIMIDE 15%, solution, 1 l, fl. CHLORHEXIDINE 1.5% + CETRIMIDE 15%, solution, 1 l, bot.	**2**	Antiseptic and detergent (medical use)	
3	DORAAMOX2T-	AMOXICILLINE, 250 mg, comp. secable AMOXYCILLIN, 250 mg, breakable tab.	**1000**	Antibiotic	**Starting**
4	DORACHLO2C-	CHLORAMPHENICOL, 250 mg, gel. CHLORAMPHENICOL, 250 mg, caps.	**1000**	Antibiotic	
5	DORADOXY1T-	DOXYCYCLINE, 100 mg, comp. DOXYCYCLINE, 100 mg, tab.	**1000**	Antibiotic;	**Treat-ment,**
6	DORAMETN2T-	METRONIDAZOLE, 250 mg, comp. METRONIDAZOLE, 250 mg, tab.	**1000**	Antiprotozoal; antibacterial	**make**
7	DORACOTR4T-	COTRIMOXAZOLE, 400 + 80 mg, comp. secable COTRIMOXAZOLE, 400 + 80 mg, breakable tab.	**1000**	Antibiotic	
8	DORAPARA1T-	PARACETAMOL (acétaminophène), 100 mg, comp. PARACETAMOL (acetaminophen), 100 mg, tab.	**1000**	Antipyrétique (pain control)	**sure**
9	DORAPARA5T-	PARACETAMOL (acétaminophène), 500 mg, comp. PARACETAMOL (acetaminophen), 500 mg, tab.	**1000**	Antipyrétique (pain control)	
10	DORACIPR5T-	CIPROFLOXACINE CHLORHYDRATE, 500 mg, comp. CIPROFLOXACINE HYDROCHLORIDE, 500 mg, tab.	**100**		**proto-cols**
11	DORAPROM2T-	PROMETHAZINE CHLORHYDRATE, 25 mg, comp. PROMETHAZINE HYDROCHLORIDE, 25 mg, tab.	**1000**	Anti-nausea	**inside**
12	DORAASCA2T-	ASCORBIQUE ACIDE, 250 mg, comp. ASCORBIC ACID, 250 mg, tab.	**1000**	Vitamin C	
13	DORARETI2T-	RETINOL (vitamine A), 200.000 UI, stabilisé, perle RETINOL (vitamine A), 200,000 IU, stabil., soft gelat. caps.	**1000**	Vitamin A	**isola-tion**
14	DORAORSA1S-	SELS DE REHYDRATATION, (S.R.O.), sachet 27,9 g/1 l ORAL REHYDRATION SALTS (O.R.S.), sachet 27.9 g/1 l	**500**	Oral re-hydration	**unit**
15	DORAORMA2S4	ReSoMal, melange réhydratant, sachet 420g/10l; ReSoMal, rehydration mix, bag 420g/10l;	**33**	Oral re-hydration with extra Potassium.	
16	DORACHLM2T-	CHLORPROMAZINE CHLORHYDRATE, 25 mg, comp. CHLORPROMAZINE HYDROCHLORIDE, 25 mg, tab.	**1000**	Tranquiliser ; chloramphénicol	**are in**
17		TRAMADOL, 50 mg, gél. TRAMADOL, 50 mg, caps.	**1000**	Painkiller	
18		CO-ARTHEMETER, tab	**840**	Anti-malaria	**place.**
19	DINJZTF0038	TRAMADOL HYDROCHLORIDE, 50 mg/ml, 2 ml, amp. TRAMADOL CHLORHYDRATE, 50 mg/ml, 2 ml, amp.	**20**	Analgesic	
20	DINJZTF0019	POTASSIUM CHLORURE, 100 mg/ml, 10 ml, amp POTASSIUM CHLORIDE, 100 mg/ml, 10 ml, amp..	**21**	Anti- hypokalaemia;	
21	DINJGLUC5V5	GLUCOSE HYPERTONIQUE, 50%, 50 ml, fl. GLUCOSE HYPER, 50%, 50 ml, vial	**5**	Energy boost;	
22	DINJARTE2A-	ARTEMETHER, 20 mg/ml, 1 ml, amp. ARTEMETHER, 20 mg/ml, 1 ml, amp.	**10**	Anti-malaria;	
23	DINJARTE8A-	ARTEMETHER, 80 mg/ml, 1 ml, amp. ARTEMETHER, 80 mg/ml, 1 ml, amp.	**18**	Anti-malaria;	
24	DINJZTF0020	CEFTRIAXONE, 250 mg, fl. Poudre + solvant IM CEFTRIAXONE, 250 mg, powder, vial + IM solvant	**10**	Antibiotic;	
25	DINJCEFT1V-	CEFTRIAXONE, 1 g, fl. poudre CEFTRIAXONE, 1 g, powder, vial	**50**	Antibiotic;	

26	DINJCHLO1V-	CHLORAMPHENICOL, 1 g, fl. poudre CHLORAMPHENICOL, 1 g, powder, vial	**100**	Antibiotic; Attention, Do not use together with chlorpromazine	
27	DINJZTF0012	SODIUM BICARBONATE, 8.4%, 1 Meq/ml, 20 ml, amp. SODIUM BICARBONATE, 8,4%, 1 Meq/ml, 20 ml, amp.	**12**	Anti metabolic acidosis	
28		CHLORPROMAZINE, 25 mg/ml, 2 ml, amp. CHLORPROMAZINE, 25 mg/ml, 2 ml, amp.	**200**	Tranquiliser ; Attention, Do not use together with chlorpromazine	
29	DINJZTF0030	PROPACETAMOL, 1 g, amp + 5 ml solvent; PROPACETAMOL, 1 g, amp + 5 ml solvent.	**100**	Antipyrétique (= Paracetamol inj.)	
30	DINJZTF0010	FUROSEMIDE, 10 mg/ml, 2 ml, amp. FUROSEMIDE, 10 mg/ml, 2 ml, amp.	**10**	Diuretic	
31	DINJWATE1A-	EAU pour injection, 10 ml, amp. plastique WATER for injection, 10 ml, plastic amp.	**200**		
32	DINFRINL1P1	RINGER LACTATE, 1 l, poche plastique + PERFUSEUR RINGER LACTATE, 1 l, plastic pouch, + SET	**200**	Intravenous re-hydration;	
33	DINFRINL1P5	RINGER LACTATE, 500 ml, poche plastique + PERFUSEUR RINGER LACTATE, 500 ml, plastic pouch, + SET	**24**	Intravenous re-hydration;	
34	DDGTMALF2--	TEST, MALARIA, Pf, rapide (Paracheck), device, 25 tests, kit TEST, MALARIA, Pf, rapid (Paracheck), device, 25 tests, kit	**1**		

1. b. KMEDMEBO1B- MODULE DRUGS under int. control

1	DORADIAZ5T-	DIAZEPAM, 5 mg, comp. DIAZEPAM, 5 mg, tab.	**1000**	Tranquiliser;	Don't use before all injectable related safery are in place.
2	DINJDIAZ1A-	DIAZEPAM, 5 mg/ml, 2 ml, amp. DIAZEPAM, 5 mg/ml, 2 ml, amp.	**100**	Tranquiliser;	
3	DINJPENA3A-	PENTAZOCINE, 30 mg/ml, 1 ml, amp. PENTAZOCINE, 30 mg/ml, 1 ml, amp.	**100**		
4	DINJPHEN2A1	PHENOBARBITAL SODIUM, 200 mg/ml, 1 ml, amp. PHENOBARBITAL SODIQUE, 200 mg/ml, 1 ml, amp.	**100**	Anti convulsant	
5	DORAZTF0106	MORPHINE SULFATE, 10 mg, gel., LP MORPHINE SULPHATE, 10 mg, caps. slow release	**168**	Painkiller; Morphine sublinguale slow release	

2. KMEDMEBO2-- MODULE MATERIEL MEDICAL; MODULE MEDICAL MATERIAL.

1	SMSUDEPT1W-	ABAISSE LANGUE; Tongue depressor.	**100**		**Before**
2	EMEQBOTP1--	BOUTEILLE, plastique, 1 l, pour dilution + bouchon a visser; BOTTLE, plastic, 1 l, for dilution + screw cap	**2**	1 for suspect cases ward and 1 for confirmed cases ward.	
3	EMEQBRUS1--	BROSSE A ONGLES, plastique, autoclavable; NAIL BRUSH	**30**	Bare hand washing at changing room 1. Discard after each shift.	
4	SDRECOTW5R-	COTON hydrophile, ROULEAU, 500 g; COTTON WOOL, hydrophillic, ROLL, 500 g	**2**	1 for suspect cases ward and 1 for confirmed cases ward.	
5	SDRECOMP1N-	COMPRESSE DE GAZE, 10 cm, 12 plis, 17 fils, NON STERILE; Gauze 10 x 10 Non sterile	**500**		**trea-tement,**
6	SDRECOMP1S-	COMPRESSE DE GAZE, 10 cm, 12 plis, 17 fils, STERILE; Gauze 10 x 10 sterile	**50**		
7	SMSUCOND1A-	CONTRACEPTIF MASCULIN, lubrifie + RESERVOIR, taille A CONDOM, lubricated + RESERVOIR, size A	**720**	For discharged recovered patients, to use up to 90 days after discharge.	**make**
8	EMEQTOUR1--	GARROT elastique, 100 x 1,8 cm; TOURNIQUET, rubber band, 100 x 1.8 cm	**4**		
9		Tire-lait manuel; Manual Breast milk pump	**2**	To relieve breast "clogging". Disinfectable model.	**safety**
10	EMEQBEDP1--	BASSIN DE LIT, inox; BEDPAN, stainless steel.	**10**	Disinfectable model (INOX or PLASTIC)	**protocols**

11	EMEQKIDD26-	BASSIN RENIFORME, 26 cm x 14 cm, inox (haricot); KIDNEY DISH, 26 cm x 14 cm, stainless steel.	**10**		**inside isolation unit are in place.**
12		BOITES A RECUPERATION AIGUILLES 4L (plastique); SHARPS CONTAINER, 4L (plastic)	**10**		
13	EHOESTRT2--	BRANCARD PLIANT en long/large, alu, 4 pieds, 220 x 58 cm; STRETCHER, TARPOLIN	**6**	Disinfectable & washable (PVC)	
14	AFURZTF0008	HORLOGE MURALE; WALL CLOCK	**2**	1 for suspect- and 1 for confirmed cases ward (pulse taking).	
15	PLIGLAMPS4-	LAMPE SOLAIRE, BP solar SL48, portable; SOLAR LAMPS BP SOLAR 48	**3**	Recharge lamp inside the risk-zone it is used in. At least 1 for suspect- and 1 for confirmed cases ward.	
16	PLIGLAMPT1-	LAMPE TORCHE, Maglite Mini, étanche, piles type R6 LAMP, TORCH, Maglite Mini, waterproof, R6 battery type	**2**	For medical doctors; (examination) .	
17	SMSUBAGP06-	SACHET plastique, pour médicaments, 6 x 8 cm ; BAG, plastic, for drugs, 6 x 8 cm	**100**		
18	SDRETAPA025	SPARADRAP, oxyde de zinc, ROULEAU, 2 cm x 5 m; TAPE, ADHESIVE, zinc oxide, ROLL, 2 cm x 5 m	**4**		
19	EMEQSPHY1A-	SPHYGMOMANOMETER, hand manometer, velcro, adult	**4**	Disinfect properly between (suspect) cases. 2 for suspect- and 2 for confirmed cases ward	
20	EMEQSPHY1P-	SPHYGMOMANOMETRE, manopoire, velcro, enfant; SPHYGMOMANOMETER, hand manometer, velcro, pediatric	**4**	Disinfect properly between (suspect) cases. 2 for suspect- and 2 for confirmed cases ward	
21	EMEQSTET2--	STETHOSCOPE, double face, clinicien; STETHOSCOPE, double cup, clinician	**12**	use.	
22	SMSUTHER1R-	THERMOMETRE, rectal, Celsius, + etui de protection ; THERMOMETER, rectal, Celsius, + protecting cover	**20**	1 per patient, must be AXILLARY ONLY. Disinfect properly after each use.	
23	ESURSCIS24-	SCISEAUX DE LORENZ, courbes, 24 cm 40-13-24 SCISSORS, LORENZ, curved, 24 cm 40-13-24	**2**	1 for each dressing room	
24	SINSIVPU18-	CATHETER COURT IV, 18 G, (1,3 x 45 mm), vert; IV PLACEMENT UNIT (cathether), 18G	**10**		**Don't use before all injectable protocols are in place.**
25	SINSIVPU20-	CATHETER COURT IV, 20 G, (1,1 x 32 mm), ROSE; IV PLACEMENT UNIT (cathether), 20G	**20**		
26	SINSSCAV25-	AIGUILLE A AILETTES, epicranienne, 25 G (0,5 x 19 mm) ; SCALP VEIN INFUSION SET, 25 G (0.5 x 19 mm), orange	**50**		
27	SINSSYRD10-	SERINGUE, u.u., Luer, 10 ml SYRINGE, disposable, Luer, 10 ml;	**200**		
28	SINSSYRD02-	SERINGUE, u.u., Luer, 2 ml SYRINGE, disposable, Luer, 2 ml;	**400**		
29	SINSNEED19-	AIGUILLE, u.u., Luer IV, 19 G (1,1 x 40 mm), creme NEEDLE, disposable, Luer IV, 19 G (1.1 x 40 mm), cream	**300**		
30	SINSNEED21-	AIGUILLE, uu., Luer IM, 21 G; NEEDLE, disposable, Luer IM, 21 G (0.8 x 40 mm), green. ;	**200**		
31	SINSNEED23-	AIGUILLE, uu., Luer SC, IM enfant, 23G; NEEDLE, disp., Luer SC, IM child, 23 G (0.6 x 30 mm), blue.	**200**		

3. KMEDMEBO3-- MODULE PROTECTION MATERIAL.

1	ELINTROS1W-	PANTALON CHIRURGICAL, tissé TROUSERS, SURGICAL,woven	**100**	1 per shift for each isolation worker, and members of the ambulance & burial teams (=trousers of scrub suit).
2	ELINTUNS1W-	TUNIQUE CHIRURGICALE, tissée TUNIC,SURGICAL,woven	**100**	1 per shift for each isolation worker, and members of the ambulance & burial teams (= blouse of scrub suit).
3		GANTS DE MENAGE, caoutchouc, reutilisable (la paire) ; GLOVES, CLEANING, rubber, reusable, (pair)	**400**	Used as second pair of gloves for sprayer, ambulance teams, and for specific heavy duty jobs.
4		GANTS de protection renforcée,latex, reutilisable (la paire) ; GLOVES, protection, latex, reusable, (pair)	**20**	For laundry, burial teams. MAPA® professionnel. Trident ref. 285.31 10 Pairs nr 8 and 10 pairs nr 10.
5		GANTS D'EXAMEN HAUT RISQUE, usage unique, ; HIGH RISK EXAMINATION GLOVES, disposable,	**4000**	Basic glove for every person inside isolation unit (Low- and High risk zones), burial- and ambulance teams. NitraTex EP **ref 4400042** Ansell Medical ® 1000 pce Small; 2000 pce Medium ; 1000 pce Large
6		GANTS CHIRURGICAUX, Latex uu paire; GLOVES SURGICAL disposable Pair	**1000**	For sensitive jobs inside High risk zone (e.g. pulse taking). 400 Pairs **SMSUGL0S7-- AND** 600 Pairs **SMSUGL0S8--**
7	SDREBANC103	BANDAGE, COHESIVE, elastic, 10 cm x 3 m BANDE COHESIVE, élastique, 10 cm x 3 m	**30**	For securing fitting of wrist band of gown with edge of glove.
8		SALOPETTE de PROTECTION; PROTECTIVE OVERALL	**700**	Mao collar welded overall. Topguard ®; Tyvek-Pro.Tech ® -- NON STERILE (= same use as gown)
9		CASAQUE CHIRURGICALE.uu., avec manches longues; GOWN, DISPOSABLE with long sleeves	**336**	Use for example in certain circumstances, such as cultural restrictions (women wearing overall / throusers..) Cut bottom if too long. HARTMANN ® 168 Pce XL and 168 Pce XXL.
10	ELINAPRS1R-	TABLIER PROTECTION, plastique HEAVY DUTY; APRON PROTECTION, plastic HEAVY DUTY	**50**	Bright color. Personalise by writing names on it.
11		BOTTES, caoutchouc, (pair) **BLANC**; BOOTS, rubber, (pair) **WHITE**	**50**	Personalise by writing names on it. 5 x nr 37; 10 x nr 39; 10 x nr 41; 20 x nr 43; 5 x nr 44.
12	ELINMASP1HF	MASQUE DE PROTEC., RESP.(PCM2000 FLUIDSHIELD) haute filtra; MASK, PROTECTION, RESP.(PCM2000 FLUIDSHIELD) high filtration	**1500**	Put this mask as first mask under the incorporated mask of the Tyvec head cover.
13		COIFFE avec masque a six lacets incorporé; CAP (HOOD) with 6 laces mask	**1000**	Topguard ®; Tyvek-Pro.Tech ® -- NON STERILE
14		COIFFE CHIRURGICAL u.u.; SURGICAL CAPS Disposable	**600**	Orthopédique non tissé polypropylène souple et leger **EVERCAP® REF C12; Code 686408BD** (Hospitera)
15		LUNETTES DE PROTECTION, plastique (GOGGLES), ; GOGGLES, PROTECTIVE, plastic	**150**	Personalised. Use anti-fog spray provided in same module of kit.
16		SPRAY anti-Buée (Trident, 2 ounce spray, #LP80); Anti-FOG spray (Trident, 2 ounce spray, #LP80)	**10**	Use to diminish fogging of goggles.
17	DEXTTALC1P1	TALC, poudre; 1 kg; TALC, powder ,1 kg	**2**	To ease putting gloves on.
18		MIROIR; +/- format A4; MIRROR +/- format A4	**2**	To be installed side by side in changing room 2. FORMAT A4 (For Transport reasons)
19		MIROIR a poignet (portable); Hand MIRROR	**1**	To allow checking if protective gear is well adjusted (closings of protective gear on back)
20		ALESE 60 x 60 cm uu; BED (under) PADS 60 X 60 cm disposable	**600**	For cleaning up spills and liquid waste.
21	SMSUBAGB2W-	SAC, plastique, mortuaire, blanc, 150 microns, 220 cm; BAG, body, plastic, white, 150 microns, 220 cm	**40**	Check zipper tab before starting burial procedure. If too short, put little lace to zipper tab before starting burial procedure. Use double if no coffin.

4. KMEDMEBO4-- MODULE LOGISTIC & SANITATION

1	PLIGLAMPS4-	LAMPES SOLAIRES BP SOLAR 48; SOLAR LAMPS BP SOLAR 48	**3**	Recharge lamp inside the risk-zone it is used in.
2	EHOEMATT1C-	HOUSSES POUR MATELAS (PVC); MATTRESS COVERS (PVC)	**10**	For suspect- and confirmed cases. Bright colour; Disinfectable.
3	PPACBAGP1B-	SAC, poubelle, plastic, 100 l, noir, 70 microns ; BAG, dustbin, plastic, 100 l, black, 70 microns	**300**	Use double for wet and organic waste.
4		SUPPORT POUBELLE 100 l; GARBAGE STAND	**5**	Foldable model. If more are needed , make locally.
5		TIR BOTTES; BOOT REMOVER	**1**	For changing room 1 If more are needed , make locally. DISINFECTABLE
6	CWATCONT20F	NOURRICE A EAU, 20 l pliable bouchon d. 5 cm plast. alim. ; CONTAINER, WATER, 20 l collaps., 5 cm cap, food grade plast	**5**	Diverse use possible
7	CWATCONT20T	(nourrice à eau pliable 20 l) ROBINET, pas de vis 5 cm ; (collapsable water container 20 l) TAP, screw type 5 cm diam	**5**	Diverse use possible
8	CSHEBLAN5W-	COUVERTURE; BLANKET	**30**	
9	PCOOBOWL2RP	BASSINE, 20L, plastique, ronde ; BASSINE, plastic, 20 l, round	**20**	Also used for water collecting under hand washing tap stand.
10		GOBELETS, Plastique; DRINKING CUPS, plastic	**20**	
11		ASSIETTES (Plastique); EATING PLATES, (Plastic)	**20**	
12		CUILLERS A SOUPE desinfectable ; Disinfectable TABLE SPOONS	**20**	
13		JERRY CANS 5 L, plastique; JERRY CANS 5 L, plastic	**10**	Easy to follow-up ORS consumption per patient .
14		SEAU, plasique, 10 l COULEUR **VERT** + COUVERCLE; Bucket 10 l plastic; **GREEN** COLOR + LID	**15**	Used for collecting laundry of patients.
15		SEAU, plasique, 10 l COULEUR **JAUNE** + COUVERCLE; Bucket 10 l plastic; **YELLOW** COLOR + LID	**15**	Used for collecting liquid waste (vomit, spills…).
16	CWATBUCK14L	SEAU, plast. alimentaire, 14 l, gerbable + COUVERCLE; Bucket 14 l	**15**	Diverse use possible
17	CWATBUCK20L	SEAU, plast. alimentaire, 20 l, carre,+ COUVERCLE ; BUCKET, food grade plastic 20 l, square + LID	**5**	Diverse use possible
18	CWATCONT12L	BAC plastique, 125 l, forme carree, gerbable **+ COUVERCLE & ROBINET;** WATER CONTAINERS 125 L **+ LID & TAP**	**10**	Chlorine solutions, hand washing tap stands.
19	CWATSPRA12-	PULVERISATEUR, 12 l, IK 12BS; SPRAYER, 12 l, IK 12BS	**4**	Guard/sprayer and ambulance- and burial teams.
20	CWATSPRA13G	(pulvérisateur 12 l, IK 12BS) JOINT de rechange ; (sprayer,12 l, IK 12BS) spare GASKET	**4**	Spare parts for 12 l sprayer.
21		PULVERISATEUR 1l, plastique SPRAYER 1L Plastique	**10**	Used in cars and as per protocol for disinfecting.
22	CWATZTF0104	CUILLER A SOUPE, plastique, 15 grammes; PLASTIC TABLE SPOONS 15 gr plastic	**10**	For measuring chlorine.
23	CWATYCAH7G5	HYPOCHLORITE de CALCIUM (HTH) 70% granules 500 g embal. IATA; HTH 70% IATA PACKING	**65 KG**	Disinfection; Water treatment.
24	KWATKCHL01-	KIT, CHLORATION & CONTROLE EAU (10.000 personnes/1 semaine); KIT, CHLORINATION & WATER CONTROL (10.000 pers/1 week).	**1**	Standard MSF chlorination kit. (Disinfection; Water treatment).
25	DEXTSOAP1B2	SAVON, 200 g, barre; SOAP, 200 g, bar	**30**	Hand washing; Laundry.

Patient-items

26		EPONGE; SPONGE	**10**	Disinfection of aprons by dipping.
27	KCAMMINS01C	MODULE INSTALLATION CAMP, et balisage; MODULE, CAMP INSTALLATION and boundary	**1**	Standard MSF-module. Set up of isolation unit (outside and inside fencing)
28	CSHEPLASW4W	PLASTIC SHEETING, tissé, 4x60m, blanc/blanc, 6 bandes, roul.; PLASTIC SHEETING, 4 x60m white, 6 bands, roll	**2**	Set up of isolation unit (outside and inside fencing); Diverse use.
29	CSHEROPE05P	CORDE, diam. 5mm, POLYPROPYLENE, fibre continue (m); ROPE, diam. 5 mm, POLYPROPYLENE endless fibers (per m)	**500 m**	Set up of isolation unit; Diverse use.
30	ASTAPENM3BB	MARQUEUR, noir, indélébile, géant, pointe carrée ; MARKER, black, permanent, large, square tip	**5**	
31	PPACTAPE1M-	RUBAN ADHESIF, MSF, PVC (rouleau); TAPE, adhesive, MSF, PVC (roll)	**10**	
32	CSHETAPE2BF	RUBAN DE BALISAGE, blanc/orange, fluorescent, rouleau 500 m ; TAPE, BOUNDARY marking, white/orange, fluorescent, roll 500m	**2**	Quick pre-fencing of risk zones or isolation unit.
33	ASTAPAPE5B-	PAPIER pour PAPERBOARD, 50 feuilles, le rouleau; FLIP CHART PAPER (roll of 50 p)	**2**	Training; identification of diverse risk zones, etc.

5. KMEDMEBO5-- MODULE PRELEVEMENT; MODULE, SAMPLING.

1	KMEDMSAM1S-	MODULE PRELEVEMENT SEROLOGIE, transport ; MODULE, SAMPLE, SEROLOGY, transport	**5**	For blood sampling on filter paper.
2	ELAEBSVC1P-	(système prél.sanguin) RECIPIENT PROTECTEUR ; (blood sampling system) CONTAINER, PROTECTION	**100**	For blood sampling.
3	ELAEBSVV1H-	(s.prél.sang.) CORPS PORTE TUBE (Vacutainer) ; (blds. syst.) HOLDER for VACUUM TUBE (Vacutainer)	**150**	For blood sampling.
4	ELAEBSVV21N	(s.prél.sang) AIGUILLE, stérile, 21G (Vacutainer); (blds.syst.) NEEDLE, sterile, 21G (Vacutainer)	**100**	For blood sampling.
5	ELAEBSVV5TP	(s.prél.sang.) TUBE SOUS VIDE, SEC, 5 ml (Vacutainer) ; blds.syst.) TUBE, VACUUM, PLAIN, 5 ml (Vacutainer)	**100**	For blood sampling.
6		SKIN-SNIP-BIOPSY-SET (MSF packed) composed of : (**1 x** POINCON A BIOPSIE USAGE 5mm UNIQUE--*SKIN BIOPSY PUNCH 5mm disposable*); (**1 x** SET ENLEVEMENT DE FIL UU; -- *SUTURE REMOVAL KIT DISPOSABLE*); (**2 x** RECIPIENT avec FORMOL (min 20 ml); -- *VIAL WITH FORMALIN (min 20 ml)*))	**5**	For skin-snip biopsy. Each set needs to be packed separately (safety).
7		(Liver puncture) Aiguille pour biopsie de tissue (Liver puncture Needle for tissue biopsy	**2**	For liver biopsy (post-mortem) If required to take liver sample, only physicians experienced in biopsies should do this.
8		(Liver punctiure) RECIPIENT avec FORMOL (min20 ml); (Liver punctiure) VIAL WITH FORMALIN (min 20 ml)	**4**	For liver biopsy (post-mortem) If required to take liver sample, only physicians experienced in biopsies should do this.
9	SINSSYRD10-	SERINGUE, u.u., Luer, 10 ml SYRINGE, disposable, Luer, 10 ml;	**5**	
10	ELAECONT6U-	POT A PRELEVEMENT, urine, plastique, non stérile, 60 ml CONTAINER, SAMPLE, urine, plastic, non-sterile, 60 ml;	**20**	For urine and stool samples. Respect cold chain for differential diagnosis.
11		BOITE, emballage triple, transport Infectious substances BOX, triple packing, transp. of infectious substances	**4**	
12		BOITE, emballage triple, transport Diagnostic Specimen; BOX, triple packing, transp. of Diagnostic Specimen.	**4**	For transport of samples of unknown diagnostic.
13		BOITE ISOTHER, emb. Triple, transp. Diagnostic Specimen; BOX ISOTHERM, triple pack., transp. of Diagnostic Specimen	**3**	For transport of samples of unknown diagnostic.
14		BOITE ISOTHER, emb. Triple, transp. Infectious subst. BOX ISOTHERM, triple pack., transp. of Infectious subst.	**2**	
15	ASTASTIC428	ETIQUETTE, AUTOCOLLANTE, A4, 28 unités 105x25 mm, pr fiches ; STICKER, ADHESIVE, A4, 28 units 105x21 mm, for stock card	**800**	For identification of samples

6. KMEDMEBO6-- MODULE LIBRARY, FORMS & STATIONARY.

1		EBOLA BRIEFING MSF 2001	**3**	MSF- Briefing document & for field use.
2	L002CLIG01E	CLINICAL GUIDELINES	**3**	MSF standard clinical guideline (English)
3	L002CLIG01F	GUIDE CLINIQUE ET THERAPEUTIQUE	**3**	MSF standard clinical guideline (French)
4	L014DRUG01F	MEDICAMENTS ESSENTIELS - Guide pratique d'utilisation	**3**	MSF standard essential drugs guideline (French)
5	L014DRUG01E	ESSENTIAL DRUGS - Practical guidelines	**3**	MSF standard essential drugs guideline (English)
6	L003HEFB02F	Controle de l'infection en cas de FIEVRE HEMORRAGIQUE VIRALE en milieu hospitalier africain, OMS/CDC 208 p	**2**	Guidelines for Viral Haemorrhagic Fevers (French)
7	L003HEFB02E	Infection control of VIRAL HAEMORRAGIC FEVERS in Afr. health. WHO/CDC 198p	**2**	Guidelines for Viral Haemorrhagic Fevers (English)
8	L003ZTF0002	PROCEDURE DE PRELEVEMENT DE SANG;	**2**	MSF - Guidelines for sampling taking (French).
9		PROCEDURES FOR BLOOD DRAWNING;	**2**	MSF - Guidelines for sampling taking (English).
10	ASTABOOE2SH	CAHIER, 210 x 297 mm, à spirale, quadr. 5 mm, rigide, 180p.; EXER. BOOK, 210x297mm, spiral bind, 5mm sq, hard cover, 180p	**5**	
11	ASTAPENM3BB	MARQUEUR, noir, indélébile, géant, pointe carrée ; MARKER, black, permanent, large, square tip	**10**	
12	ASTAPENF1BS	CRAYON FEUTRE, pointe fine, noir; PEN, FELT, black, sharp	**10**	
13		PAPIER CARBONNE CARBON PAPER	**200**	Epidemiology (Field copy of identification forms)
14	L003ZTF004	Standard Forms for Haemorrhagic Fev. (paper) Eng + fr.Set	**2**	Case and contact definitions (EHF); Case reporting form; Contact recording form; Contact tracing form; Steps for putting ON (& OFF) protective clothing); Clinical data form.
15	L003ZTF004	Standard Forms for Haemorrhagic Fev. (disc) Eng + fr., set	**1**	Case and contact definitions (EHF); Case reporting form; Contact recording form; Contact tracing form; Steps for putting ON (& OFF) protective clothing); Clinical data form.
16		Set posters of "Dressing protocols".	**1**	For changing rooms & training.
17	ASTAHOLD1P-	PORTE BLOC, ECRITOIRE, rigide, avec pince et rabat A4; CLIPBOARD A4 plastic	**10**	
18	ASTADIVI1PP	CHEMISE, plastique, transparent, perforée, A4 ouvert en haut; Plastic envelopes for forms	**100**	

25. Module 7(assessment & sampling) Ebola Haemorrhagic Fever Kit

Use and logic behind it:

This module **can be ordered separately for preparedness**.

The module, allows a team to safely visit a site, assess a rumour of suspicion of VHF, and safely take, pack and transport samples. It includes all the necessary sampling, protection & disinfection material for two sample takers, and some extra protective material to install a small holding facility.

It can be useful to have this module in risk countries with many reports of suspected VHF, where it can be used for identification of possible outbreaks.
The complete Ebola Haemorrhagic Fever Kit can then be ordered if an isolation unit requires to be set up after lab. confirmation of a positive case.

7. KMEDMEBO7-- MODULE ASSESSMENT & SAMPLING

1	EMEQTOUR1--	GARROT elastique, 100 x 1,8 cm; TOURNIQUET, rubber band, 100 x 1.8 cm	**1**	
2		BOITES A RECUPERATION AIGUILLES 4L (plastique); SHARP CONTAINER, 4L (plastic)	**2**	Must be disposed of safely.
3	DEXTIODP1S2	IODE POVIDONE, 10%, solution, 200 ml, fl. Verseur ; IODINE POVIDONE, 10%, solution, 200 ml, dropper bot.	**1**	Antiseptic and disinfectant (medical use).
4	SDRETAPA025	SPARADRAP, oxyde de zinc, ROULEAU, 2 cm x 5 m; TAPE, ADHESIVE, zinc oxide, ROLL, 2 cm x 5 m	**1**	
5	EMEQSPHY1A-	SPHYGMOMANOMETRE, manopoire, velcro, adulte ; SPHYGMOMANOMETER, hand manometer, velcro, adult	**3**	Disinfect properly between (suspect) cases.
6	EMEQSPHY1P-	SPHYGMOMANOMETRE, manopoire, velcro, enfant; SPHYGMOMANOMETER, hand manometer, velcro, pediatric	**3**	Disinfect properly between (suspect) cases.
7	EMEQSTET2--	STETHOSCOPE, double face, clinicien; STETHOSCOPE, double cup, clinician	**3**	Disinfect properly between (suspect) cases.
8	SMSUTHER1R-	THERMOMETRE, rectal, Celsius, + etui de protection ; THERMOMETER, rectal, Celsius, + protecting cover	**5**	Use as AXILLARY thermometer ONLY.
9	SDRECOTW5R-	COTON hydrophile, ROULEAU, 500 g ; COTTON WOOL, hydrophillic, ROLL, 500 g	**1**	
10		GANTS DE MENAGE, caoutchouc, reutilisable (la paire) ; GLOVES, CLEANING, rubber, reusable, (pair)	**3**	Use as second pair for specific heavy duty jobs.
11		GANTS D'EXAMEN HAUT RISQUE, usage unique, ; HIGH RISK EXAMINATION GLOVES, disposable,	**300**	Baisic (first) pair of gloves.
12	SMSUGL0S8--	GANTS CHIRURGICAUX, Latex uu paire; GLOVES SURGICAL disposable Pair	**50**	Use as second pair for sensitive jobs (e.g. pulse taking).
13	ELINTROS1W-	PANTALON CHIRURGICAL, tissé TROUSERS, SURGICAL,woven	**5**	(= trousers of scrub suit)
14	ELINTUNS1W-	TUNIQUE CHIRURGICALE, tissée TUNIC,SURGICAL,woven	**5**	(= blouse of scrub suit)
15		CASAQUE CHIRURGICALE.uu., avec manches longues; DISPOSABLE GOWN with long sleeves	**28**	HARTMANN ® XXL.
16		SALOPETTE de PROTECTION; PROTECTIVE OVERALL	**10**	Mao collar welded overall. Topguard ®; Tyvek-Pro.Tech ® -- NON STERILE
17	SDREBANC103	BANDAGE, COHESIVE, elastic, 10 cm x 3 m BANDE COHESIVE, élastique, 10 cm x 3 m	**2**	For securing fitting of wrist band of gown with edge of glove.
18	ELINAPRS1R-	TABLIER PROTECTION, plastique HEAVY DUTY; APRON PROTECTION, plastic HEAVY DUTY	**5**	
19		BOTTES, caoutchouc, (pair) **BLANC**; BOOTS, rubber, (pair) **WHITE**	**5**	2 pairs size 39; and 3 pairs size 43

20	ELINMASP1HF	MASQUE DE PROTEC., RESP.(PCM2000 FLUIDSHIELD) haute filtra; MASK, PROTECTION, RESP.(PCM2000 FLUIDSHIELD) high filtration	**300**	
21		COIFFE CHIRURGICAL u.u. ; SURGICAL CAPS Disposable	**50**	Cagoule Ortopédique non tissé polypropylène souple et leger **EVERCAP ® REF C12 ; Code 686408BD** (Hospitera)
22		COIFFE avec masque a six lacets incorporés; CAP (HOOD) with 6 laces mask	**50**	Topguard ®; Tyvek-Pro.Tech ® -- NON STERILE
23		LUNETTES DE PROTECTION, plastique (GOGGLES), ; GOGGLES, PROTECTIVE, plastic	**5**	Use anti-fog spray provided in same module of kit.
24		SPRAY anti-Buée;(2 ounce spray); Anti-FOG spray (2 ounce spray)	**1**	Use to diminish fogging of goggles.
25	SMSUBAGB2W-	SAC, plastique, mortuaire, blanc, 150 microns, 220 cm ; BAG, body, plastic, white, 150 microns, 220 cm	**4**	Use double if no coffin.
26		EBOLA BRIEFING MSF 2001	**1**	Briefing document & field use.
27	L002CLIG01E	CLINICAL GUIDELINES	**1**	MSF standard clinical guideline (English)
28	L002CLIG01F	GUIDE CLINIQUE ET THERAPEUTIQUE	**1**	MSF standard clinical guideline (French)
29	L014DRUG01F	MEDICAMENTS ESSENTIELS - Guide pratique d'utilisation	**1**	MSF standard essential drugs guideline (French)
30	L014DRUG01E	ESSENTIAL DRUGS - Practical guidelines	**1**	MSF standard essential drugs guideline (English)
31	L003HEFB02F	Controle de l'infection en cas de FIEVRE HEMORRAGIQUE VIRALE en milieu hospitalier africain, OMS/CDC 208 p	**1**	Guidelines for Viral Haemorrhagic Fevers (French)
32	L003HEFB02E	Infection control of VIRAL HAEMORRAGIC FEVERS in Afr. health. WHO/CDC 198p	**1**	Guidelines for Viral Haemorrhagic Fevers (English)
33	L003ZTF0002	PROCEDURE DE PRELEVEMENT DE SANG FR;	**1**	MSF - Guidelines for sampling taking (French).
34	L003ZTF0002	PROCEDURES FOR BLOOD DRAWNING ENG.	**1**	MSF - Guidelines for sampling taking (English).
35	L003ZTF004	Standard Forms for Haemorrhagic Fev. (paper) Eng + fr.Set	**2**	Case and contact definitions (EHF); Case reporting form; Contact recording form; Contact tracing form; Steps for putting ON (& OFF) protective clothing); Clinical data form.
36	L003ZTF004	Standard Forms for Haemorrhagic Fev. (disc) Eng + fr.	**1**	Case and contact definitions (EHF); Case reporting form; Contact recording form; Contact tracing form; Steps for putting ON (& OFF) protective clothing); Clinical data form.
37	ASTABOOE2SH	CAHIER, 210 x 297 mm, à spirale, quadr. 5 mm, rigide, 180p.; EXER. BOOK, 210x297mm, spiral bind, 5mm sq, hard cover, 180p	**1**	
38	ASTAPENM3BB	MARQUEUR, noir, indélébile, géant, pointe carrée ; MARKER, black, permanent, large, square tip	**1**	
39	ASTAPENF1BS	CRAYON FEUTRE, pointe fine, noir; PEN, FELT, black, sharp	**3**	
40	PPACBAGP1B-	SAC, poubelle, plastic, 100 l, noir, 70 microns ; BAG, dustbin, plastic, 100 l, black, 70 microns	**20**	
41		PULVERISATEUR 1L Plastique SPRAYER 1L Plastic	**3**	
42	CWATZTF0104	CUILLER A SOUPE, plastique, 15 grammes; PLASTIC TABLE SPOONS 15 gr plastic	**5**	For measuring chlorine (1 table spoon (cuiller à soupe) holds ~15 g HTH).
43	CWATYCAH7G5	HYPOCHLORITE de CALCIUM (HTH) 70% granules 500 g embal. IATA; HTH 70% IATA PACKING	**5**	Disinfection; Water treatment.
44	DEXTSOAP1B2	SAVON, 200 g, barre; SOAP, 200 g, bar	**10**	
45	PPACTAPE1M-	RUBAN ADHESIF, MSF, PVC (rouleau); TAPE, adhesive, MSF, PVC (roll)	**1**	
46	ESURSCIS24-	SCISEAUX DE LORENZ, courbes, 24 cm 40-13-24 SCISSORS, LORENZ, curved, 24 cm 40-13-24	**1**	
47	CSHETAPE2BF	RUBAN DE BALISAGE, blanc/orange, fluorescent, rouleau 500 m ; TAPE, BOUNDARY marking, white/orange, fluorescent, roll 500m	**1**	Quick pre-fencing of risk zones or isolation unit.

48	KMEDMSAM1S-	MODULE PRELEVEMENT SEROLOGIE, transport ; MODULE, SAMPLE, SEROLOGY, transport	**2**	For sampling on filter paper.
49	ELAEBSVC1P-	(système prél.sanguin) RECIPIENT PROTECTEUR ; (blood sampling system) CONTAINER, PROTECTION	**10**	For blood sampling.
50	ELAEBSVV1H-	(s.prél.sang.) CORPS PORTE TUBE (Vacutainer) ; (blds. syst.) HOLDER for VACUUM TUBE (Vacutainer)	**15**	For blood sampling.
51	ELAEBSVV21N	(s.prél.sang) AIGUILLE, stérile, 21G (Vacutainer); (blds.syst.) NEEDLE, sterile, 21G (Vacutainer)	**10**	For blood sampling.
52	ELAEBSVV5TP	(s.prél.sang.) TUBE SOUS VIDE, SEC, 5 ml (Vacutainer) ; blds.syst.) TUBE, VACUUM, PLAIN, 5 ml (Vacutainer)	**10**	For blood sampling.
53		SKIN-SNIP-BIOPSY-SET (MSF packed) composed of : (**1 x** POINCON A BIOPSIE USAGE 5mm UNIQUE--*SKIN BIOPSY PUNCH 5mm disposable*); (**1 x** SET ENLEVEMENT DE FIL UU; -- *SUTURE REMOVAL KIT DISPOSABLE*); (**2 x** RECIPIENT avec FORMOL (min 20 ml); -- *VIAL WITH FORMALIN (min 20 ml*))	**3**	For skin-snip biopsy. Each set needs to be packed separately.
54		(Liver punctiure) Aiguille pour biopsie de tissue (Liver punctiure) Needle for tissue biopsy	**1**	For liver biopsy (post-mortem) If required to take liver sample, only physicians experienced in biopsies should do this.
55		(Liver punctiure) RECIPIENT avec FORMOL (min 20 ml); (Liver punctiure) VIAL WITH FORMALIN (min 20 ml).	**2**	For liver biopsy (post-mortem) If required to take liver sample, only physicians experienced in biopsies should do this.
56	SINSSYRD10-	SERINGUE, u.u., Luer, 10 ml SYRINGE, disposable, Luer, 10 ml;	**5**	
57	ELAECONT6U-	POT A PRELEVEMENT, urine, plastique, non stérile, 60 ml CONTAINER, SAMPLE, urine, plastic, non-sterile, 60 ml;	**5**	For urine and stool samples. Respect cold chain for differential diagnosis (dysentery).
58		BOITE, emballage triple, transport Infectious substance; BOX, triple packing, transp. of Infectious substance.	**1**	
59		BOITE, emballage triple, transport Diagnostic Specimen; BOX, triple packing, transp. of Diagnostic Specimen.	**1**	For transport of samples of unknown diagnostic.
60		BOITE ISOTHER, emb. Triple, transp. Infectious substance; BOX ISOTHERM, triple pack., transp. of Infectious substance	**1**	
61		BOITE ISOTHER, emb. Triple, transp. Diagnostic Specimen; BOX ISOTHERM, triple pack., transp. of Diagnostic Specimen	**1**	For transport of samples of unknown diagnostic.
62	ASTASTIC428	ETIQUETTE, AUTOCOLLANTE, A4, 28 unités 105x25 mm, pr fiches; STICKER, ADHESIVE, A4, 28 units 105x21 mm, for stock card	**100**	For identification of samples.
63		Set posters of "Dressing protocols".	**1**	

26. Example of Job profile doctor on duty in the isolation ward

Objective of the post:
Doctor and clinical officer are responsible for the clinical evolution of the patient. They must be present as soon a new patient arrive and ensure that the protocols are respected.

Responsibilities:

- Doctor is aware of the risks involved in working in the isolation ward.
- Doctor is following all the regulations concerning protective measures.
- Do a ward round twice a day.
- Visit frequently the unstable patient according the clinical evolution.
- Prescribe the treatment in the patient file.
- Ensure that the treatment has been given according the prescription.
- Inform the doctor in charge of the isolation ward about the evolution of the patient admitted.
- Take care of the new admission as soon they are admitted:
    - Fill in the patient form
    - Inform the laboratory technician responsible for the blood sample
- Supervise the nurses.
- Attend the weekly meeting of the isolation ward.

Accountable to:

- The doctor is accountable to the Doctor in charge of the isolation ward,

Working hours:
On call 24h, working hours according the needs

27. Example of Job profile doctor in charge of the isolation ward

Objective of the post:
Doctor in charge of the isolation ward is responsible of the management of the unit.
He should be aware at any time about what is going on in the ward: the evolution of the patients, the requests, or the problems with the staff.
He is responsible to integrate his unit among the hospital, explaining the goals and rules of the unit to the rest of the hospital staff.

Responsibilities:

- Doctor is aware of the risks involved in working in the isolation ward.
- Doctor is following all the regulations concerning protective measures.
- Ensure that the new staff members are trained properly.
- Responsible to organise a weekly meeting with the medical and non medical staff
- Responsible for forwarding the problems coming out of the weekly meeting to the medical superintendent.
- Make duty roster for the Dr and clinical officer
- Should pass in the isolation ward or be in touch with the Dr. on duty at least twice a day, to be aware at any time about what is happening in the isolation unit.
- Record data in the laboratory book.
- Supervision of the Doctor and clinical officer
- Management of the isolation unit
- To inform the medical superintendent about the situation in the isolation unit before the 5 pm task force meeting.

Accountable to:

- The doctor in charge of the isolation ward is accountable to the Medical superintendent of the hospital.

Working hours:

On call during 24 h at any time.

28. Example of Job profile head nurse

Objective of the post:
The head nurse is supposed to co-ordinate the nursing staff and ensure that the care given to the patients is given properly and according the request of the Doctor.
She is also responsible to ensure that the staff is working safely.

Responsibilities:

- Check daily if enough protective gear for the day in the dressing rooms
- Request protective gear to the administrator
- Ensure that the protective gear is used properly
- Arrange the shelves in the dressing room properly
- Check the drugs consumption and order to the medical superintendent
- In charge of the supervision of the new nurses training concerning the rules in the isolation unit
- Check and order to the medical superintendent other requirements (thermometer, patient forms, stethoscope…)
- Make the duty roster for the nurses
- Follow the job profile of the nurse
- Supervision of the nurses
- Organise transmission between each shift

Accountable to:
The head nurse is accountable to the doctor in charge of the isolation unit.

Working hours:

- Working hours according the shift
- On call during daytime.

29. Example of Job profile nurse

Objective of the post:
The nurse is the medical person taking care of the patient on a daily basis. Most of her time, she is near the patient and knows the evolution of the patient. Communication of information concerning nursing is very important.

Responsibilities:
Non-adherence to the regulations can result in immediate dismissal.

- Nurse is aware of the risks involved in working in the isolation ward
- Nurse is following all the regulations concerning protective measures

- *Office and information duties:*
  -Make a detailed report at the end of the shift in the report book
  -Record new patients in the admission book
  -Fill in the data form as required
  -Attend the weekly meeting
  -Inform the head nurse of any missing item
  -Order, if necessary, the drugs prescribed by the Doctor
  -Inform the surveillance team at the end of the night shift about the general condition of the patient (to inform the relatives)
  -Inform the burial team when a patient died
  -Know the menu of the patient and order to the kitchen

- *Patient duties:*
  -Ensure that the items for admission are in the room before each admission
  -Explain the rules of the isolation unit to all new admitted patient
  -Explain the rules of the isolation to the relatives
  -Give the protective gear required to the relative and ensure that they know the rules of the isolation
  -Take the vital signs at least once per shift and record it in the patient file
  -Have ward round with the doctor, and safely record the medical information
  -Responsible to give treatment on time as prescribed by the doctor
  -Ensure that each patient has ORS or plain water for supporting the dehydration
  -Record the observation of the cleaner concerning the feeding and the intake of fluids
  -Ensure that the patients are clean
  -Assist the patient for his/her bathing
  -Give fluid to the patient as required by the doctor
  -Ensure that the patients and their linen are clean
  -At any time, call the Doctor on duty if any medical problem

Accountable to:

- The nurse is accountable to the head nurse of the isolation ward

Working hours:

- Working hours according the shift
- From Monday till Saturday

30. Example of Job profile Chlorine Preparation / Laundry

Objective of the post:
All areas in the Isolation ward have sufficient chlorine solution in the appropriate strength.
Laundry is collected, chlorinated, washed and dried.
All this is done in a safe way for him/herself, for the other staff, the patients and the environment.

Responsibilities:
Non-adherence to the regulations can result in immediate dismissal.

- Worker is aware of the risks involved in working in the isolation ward
- Worker is following all the regulations concerning protective measures
- Chlorine maker / laundry man is wearing boots, gloves and apron whole the time
- Making chlorine:
    - Morning:
        - Makes mother stock of 0.5% solution in sufficient quantity
        - Fills all hand washing containers with 0.05% solution
        - Fills the foot baths with 0.5% solution
        - Changes water in the basins next to chlorine foot baths
        - Fills the sprayers with 0.5% and 0.05% according to the needs
    - Late afternoon:
        - Checks all containers and adds solution if needed
        - Changes 0.5% solution in foot baths
        - Refreshes water in the basins next to chlorine foot baths
        - Fills all the sprayers with 0.5% or 0.05% solution according to the need
        - Keeping stock of all necessary material and orders in time from the head nurse
- Laundry:
    - Morning:
        - Collects laundry from patients given by the inside cleaner (to meet at the foot bath) which has been soaked in 0.05% overnight
        - Laundry is put from the ‘inside’ bucket into the bucket of the laundry (not exchanging buckets!)
        - Laundry is washed normally like other laundry
        - Collects reusable aprons and gloves and soaks it in 0.5% solution for one hour
        - Rinses reusable material in water and dries them on the laundry line
    - Daily routine:
        - Launders all reusable material in chlorine and rinses with water if needed
        - Folds all dried laundry and put it in the appropriate places
        - Washed and dried gloves and aprons to be put on the shelves in the changing room

Accountable to:
- Chlorine maker is hierarchal accountable to the head nurse.
- Chlorine maker is functionally accountable to the health educator

Working hours:
- Working hours are from 8 am till 5 pm
- From Monday till Saturday

31. Example of Job profile for Burner (person burning the waste)

Objective of the post:

1. Dry and wet medical waste in bags is collected, transported and burned in the waste pit.
2. All tasks are carried out in a way that is safe for him/herself, for the other staff, the patients and the environment.

Responsibilities:

Non-adherence to the regulations can result in immediate dismissal.

- Worker is aware of the risks involved in working in the isolation ward
- Worker is following all the regulations concerning protective measures
- Burner wears full protective clothing: boots, double pair of gloves, gown, apron, head cover, mask and goggles
- Concerning collection of dry or wet waste produced in the isolation ward:
    - The closed waste bag is put through the 'waste-window' by the inside-cleaner
    - Burner collects bags from the 'waste-window' and put it immediately in the burning site of the waste pit
- Concerning collection of waste that is produced in the changing room:
    - When waste bags are ¾ full, the bags have to be closed without touching the waste inside the bag. Disinfected outside of the bag by spraying.
    - The bag is being transported to the burning site
- Concerning the burning f the waste:
    - The bag is put in the burning area of the waste pit
    - The waste is sprinkled with enough paraffin to allow easy burning
    - The waste is lit with matches, without handling the waste by hand
    - The ashes have to be pushed into the waste pit with the rake
- Keeping stock of material needed and order in time at the head nurse
- Routine: helping out chlorinator where necessary or requested

Accountable to:

- The burner is hierarchically accountable to the head nurse
- The burner is functionally accountable to the health educator

Working hours:

- Working hours are from 8am till 5pm
- From Monday till Saturday

32. Example of Job profile Cleaner for inside isolation area

Objective of the post:

1. The suspected case area and the confirmed case area are kept clean and properly organized. All waste is disposed of in an appropriate way.
2. All tasks are carried out in a manner that is safe for him/herself, for the other staff, the patients and the environment.

Responsibilities:

Non-adherence to the regulations can result in immediate dismissal.

- Worker is aware and understands of the risks involved in working in the isolation ward
- Worker follows all the regulations concerning protective measures
- The worker participates in the weekly staff meeting
- Daily routine:
  - Make sufficient stock of 0.05% solution daily (request mother solution from chlorinator)
  - Clean the floor and the walls with water and then disinfect with 0.5% solution in the morning and in the afternoon
  - Clean the veranda two times a day with water and 0.5% solution
  - Clean the latrine and bathroom with 0.5% solution at least two times a day
  - Put squeezers, brooms, towels, etc in a separate place inside the compound
  - Assist the nurse with washing the patient if no attendant present
  - Assist the nurse with feeding the patient if no attendant present
  - Informs nurse on duty if patient has any need
  - Supervision and help of the relatives
  - Disinfect the bed once a day with 0.5% chlorine solution (move the patient from bed)
  - Disinfect personal plates, cups and cutlery when necessary and make sure all patients receive back their own material
  - After discharge of the patients, disinfect all personalized buckets, cups, bed, etc
- Liquid waste (vomit, blood or stools in a bucket):
  - All the yellow buckets must contain one cup of 0.5% solution
  - Fill bucket containing vomit or stools with 0.5% solution (so that waste is completely covered) and soak for 15 minutes
  - After 15 minutes dispose of the fluid waste into the latrine pit
  - Wash the bucket and the latrine with 0.5% solution
- Spilled stools, vomit or blood on ground, bed or blanket:
  - Pour 0.5% solution directly on the spot and soak for 15 minutes, clean then with disposable pad
  - Spots on the wall should be sprayed with a hand sprayer with 0.5% solution
  - Clean the spot with disposable pad and dispose off in the latrine
  - Clothes that have been spilled upon can after chlorinating follow the same treatment as normal laundry (see below)
- Laundry:
  - Collect the personal laundry from the green bucket of each patient
  - Laundry (blankets, clothes) are being soaked in 0.05% solution in a big container and soaked overnight
  - After chlorinating laundry is drained and the container is put in the chlorine foot bath to be collected by the laundry man
- Dry waste in the
  - Empty waste bags when ¾ full
  - Close the waste bag and pass it on through the ‘waste window’ to be collected by the person who burns it

Accountable to:

- The cleaner is hierarchically accountable to the head nurse
- The cleaner is functionally accountable to the health educator

Working hours:

Working hours are from 8am till 5pm

33. Example of Job profile guard / cleaner front side

Objective of the post:

- All people entering and leaving the isolation ward are being screened and their hands and feet sprayed with chlorine solution. Only authorized people enter the isolation ward.
- The front side of the isolation ward is clean and organized.
- All tasks are carried out in a manner that is safe for him/herself, for the other staff, the patients and the environment.

Responsibilities:
Non-adherence to the regulations can result in immediate dismissal.

- Worker is aware of the risks involved in working in the isolation ward
- Worker is following all the regulations concerning protective measures
- Guarding:
    - Screens all people wanting to enter and only allows authorized people to enter
    - Informs the nurse on duty about any visitor
    - Sprays hands and foot of all people entering
    - Makes sure that all people wear the appropriate protective material in the LOW RISK area
    - Sprays hands and soles of the shoes of people leaving the compound
    - Checks that no material belonging to the isolation ward is leaving the compound
    - Collects food for the patient if requested
- Cleaning:
    - Cleans the LOW RISK area of the front side of the compound
    - Cleans the veranda on the front side in the LOW RISK area
    - Cleans and organizes the changing room (including shelves)
    - Organizes the place where aprons are hanging (dirty ones in laundry container, clean ones on shelve)

Accountable to:

- The guard is hierarchically accountable to the head nurse
- The guard is functionally accountable to the health educator

Working hours:

- Working hours are from 8am till 5pm
- From Monday till Saturday

34. Management of accidental exposure

Needle stick injury:

Procedure:

- immerse exposed site in 70% alcohol for 30 seconds or in 0.5% chlorine solution for 3 minutes;
- wash with soap and clean water;
- flush site in running water for 30 seconds;
- apply dressing if needed;
- report accident to supervisor of isolation unit or physician in charge;
- the injured person becomes a **contact** (not a suspect) and must be followed for 21 days.

Accidental contact with body fluid of a patient:

Definition: contact of body fluid through broken skin or mucous membranes of the mouth, nose or eyes.

(persons with open wounds must not work in isolation facility)

Procedure:

- wash area with 0.5% bleach or with soap and water for exposure to **broken skin;**
- thoroughly rinse **nose or mouth** with 0.05% bleach;
- flush **eye** copiously with water;
- report exposure to isolation unit supervisor or to physician in charge;
- the exposed person becomes a **contact** (not a suspect) and must be followed for 21 days.

35. Example of training module for isolation unit personnel

Introduction: This module is designed for medical personnel but can be modified for training cleaners, guards, and other workers in the unit as required by circumstances. It should be revised in accord with new information as it becomes available

HISTORY
-Previous outbreaks of Ebola associated with human disease

EPIDEMIOLOGY:
- -geography
- -reservoir
- -demography: age, sex
- -high risk: pregnant women, HIV positive, infants (especially malnourished), health care workers, care givers

VIROLOGY:
- human Ebola strains: Ebola Sudan, Ebola Zaire (also infect primates)
- monkey Ebola strains: Ebola Reston, Ebola Ivory Coast (humans infected by contact with sick monkey
- related filovirus: Marburg: both humans and monkeys can be infected

PATHOPHYSIOLOGY
- sites most affected by viral infection
- physiologic consequences

CLINICAL COURSE of VHF: Spectrum of mild …..fatal
- -incubation period: 2-21 days but usually 5-10 days before symptoms begin. A person in the incubation period cannot transmit Ebola infection
- -onset of infectivity and thus possibility of transmission begins with onset on symptoms
- -early symptoms: day 1-2
  - systemic: abrupt fever, headache, joint and muscle pain, asthenia, anorexia
  - gastrointestinal: nausea, vomiting, watery diarrhoea, abdominal pain
- -mid course: Day 3-6
  - epigastric and RUQ pain (hepatic area), hepatomegaly
  - bloody diarrhoea, melena
  - dehydration, hypokalemia
  - conjunctival injection
  - basilar rales, cough
  - substernal burning chest pain
  - progressive weakness
  - sore throat
- -late signs: Day 5-7
  - fine maculopapular rash, sparing face
  - bleeding signs: epistaxis, hematemesis, subconjunctival hemorrhage, oozing from venipuncture sites, gingival hemorrhage, melena
  - circulatory failure
  - anuria, ascites, edema
  - tachypnea, pulmonary edema occasionally (?iatrogenic)
  - confusion, disorientation, agitation, coma
- -time to death: 10-12 days from onset of symptoms, often less (median Gulu 8 days)
- -time to recovery: 12-17 days from onset of symptoms: usually begins by day 8
  - sequellae: myalgia, arthralgia, visual loss, uveitis, conjunctivitis, suppurative parotitis, unilateral orchitis, tinnitus, hearing loss, bizarre behaviour ultimately resolving (Sudan)

PROGNOSIS:
- sex: no difference in mortality. Limited data HIV: 7/8 died
- age: worse with increased age: (Kikwit: 95% over age 59 died)
- pregnancy: note frequency of abortions: 95% mortality of pregnant women

TRANSMISSION
contact: unprotected contact with body fluids including urine, blood, stool, probably breast milk and sweat, close body contact (sleeping in same bed), contact with clothing of patient
contact: with corpse (late stage disease and corpse have high levels of virus and are most infectious) by washing or touching body
a-symptomatic persons including contacts cannot transmit infection
not airborne but transmitted by droplets (coughing, spitting, projectile vomiting)
semen from convalescent case may transmit infection up to 3 months
contact with sick primate (Reston, Ivory Coast) or carcass of dead primate (Gabon)

CASE DEFINITION: *see annex 5*

DIAGNOSIS AND ANTIBODY RESPONSE
Clinical: fever and history of contact with known Ebola case are most useful tools
PCR: may be positive as early as 1-2 days after onset but false positives a risk
ANTIGEN: usually positive by day 4 of illness
IgM: early antibody: appears between day 2 – 9 of clinical illness, usually gone by 6 weeks
IgG: appears day 6 – 18 of illness and may last 2 years (?or more). Thought to protect against subsequent infection with same strain. Cross protection against Ebola Sudan by antibody to Ebola Zaire but not vice versa.

LABORATORY DATA:
Liver tests: AST sensitive early indicator (day 1 or 2 of illness). LDH also high
Modest elevation of alkaline phosphatase and ALT, normal bilirubin,
Hematology: decreased lymphs, increased granulocytes, decreased platelets
mild DIC parameters in single case reports
Miscellaneous;
increased amylase, unknown source
increased creatinine, BUN
hypokalemia related to g.i.losses
hypoxemia: terminal with O2 saturation in the 80's, multifactorial
skin biopsy: post mortem: + in nearly 100% Ebola Zaire, about 70% of Ebola Sudan

TREATMENT:
Symptomatic: hydration, nutritional support, pain medication, selective antimalarial and antibiotic treatment depending on clinical evaluation.
Avoid injections, infusions as much as possible

UNIVERSAL and VHF PRECAUTIONS: *see points II B. c and d*

Protocols FOR PUTTING ON AND REMOVING PROTECTIVE CLOTHING: *see annexes 15 and 16*

PREPARATION OF CHLORINE SOLUTIONS: *see annex 17*

TRAINING in ISOLATION UNIT (model or actual unit):
Review organization and rationale plan
Principles of separation of suspect and confirmed cases
High and low risk areas
job descriptions

36. Example of training module for health centres

1. EBOLA: (see general lecture for Isolation Unit Staff: ANNEX 35)

-History of previous outbreaks
-Viral strains associated with outbreaks
-Reservoir
-incubation period
-signs and symptoms:
-transmission and notion of contact: how disease is not spread, persons at risk
-diagnosis: see case definition in ANNEX 5

2. MANAGEMENT OF SUSPECTED EBOLA CASE IN COMMUNITY

- isolate patient from rest of family members
- instruct family not to touch patient if possible and to wash hands with soap after any contact with patient, body fluids or clothing or bedding
-instruct family to have patient use separate latrine facility if possible
-report case immediately and request ambulance via established communication channel

3. MANAGEMENT OF SUSPECTED EBOLA CASE IN HEALTH CENTER

-report suspected case immediately and request ambulance via established communication channel
-place patient in identified isolation (holding) area on mattress covered with plastic sheeting
-provide bucket for collection of body waste, vomit with fresh chlorine solution in bottom
-provide cup for water
-avoid touching or treating patient: if unavoidable put on disposable gloves, plastic apron
-instruct patient attendant to avoid direct contact with patient, clothing or body fluids and if possible, provide disposable gloves to attendant
-prepare small pit for disposal of decontaminated waste, clothing, gloves or other materials used during patient's stay in centre
-disinfect mattress cover, utensils used by patient with chlorine solution

4. UNIVERSAL PRECAUTIONS

- misdiagnosis of Ebola is possible and that universal precautions are the most effective way to avoid inadvertent infection of health workers and other patients
- exposure during delivery or abortion poses risk which requires protective measures
- universal precautions with VHF modifications (see points II B. c and d): explain carefully
    a. personal protection: hand washing, use of protective materials
    b. cleaning and disinfection of beds, examining table, bed stands between patients
    c. cleaning and sterilization of instruments
    d. cleaning of re-usable protective materials: aprons, boots and household gloves
    e. cleaning of floors, latrines with soap and water

5. CHLORINATION

- preparation of chlorine solutions using locally available chlorine preparations (assuming that the concentration of chlorine is known)
- use of strong (0.5%) and dilute (0.05%) solutions

6. COMMUNITY EDUCATION

-instruct community on mode of Ebola transmission and emphasize the reason for and the need for prompt isolation and referral to designated treatment facility
-instruct community on how to manage patients at home until transport arrives

37. Universal precautions

UNIVERSAL PRECAUTIONS

1. Wash hands
2. Wear gloves
3. Routine cleaning
4. Handle needles and sharps safely
5. Dispose safely of spills and waste
6. Wear mask & goggles if splash is likely

1. Wash hands:

-before and after touching patient;

-after any accidental contact with body fluids;

-prepare soap dish, basin, container of clean water, waste receptacle and towel for one single use; or air dry hands;

3. Wear gloves:

-if there is contact with body fluids, broken skin or mucous membranes;

-remove gloves, discard in waste bucket and wash hands after each use;

4. Routine cleaning with soap or detergent:

-of beds, bedside tables, examination tables;

-of floors and latrines;

5. Handle needles and sharps safely:

-separate needles from syringes safely;

-put needles in puncture resistant sharps container;

-do not re-cap needles;

-do not re-use needles or syringes;

- dispose of container in sharps pit;

6. Safe disposal of spills and waste:

-remove with cloth ;

-wash area with soap and water or detergent or chlorine solution and let dry;

7. Wear mask & goggles:

-if a splash is likely;

Note : «Universal precautions» are basic precautions, which must normally be standard in place in every health structure.

38. Transporting & IATA regulations.

The transport of some samples (see sampling descriptions), are subject to **strict ICAO** (International Civil Aviation Organisation) / **IATA** (International Air Transport Association), **UPU** (Universal Postal Union) **regulations** concerning packaging, labelling and transport.
Apart from the regular ICAO, IATA, UPU and regulations on Infectious substances and Diagnostic Specimens, there are also **State variations** and **Operator variations**.

Due to regularly changing regulations, and to the exceptions per operator and country, an exact procedure description is almost impossible. If you have to send samples, **ask your medical department and if possible the WHO representative** how to proceed for your specific case.

General requirements (**For information only, check before shipping**):

- For **both "Infectious substances" and "Diagnostic specimens**" a "Basic triple packaging" system must be used.

Basic triple packaging system:
Samples have to be packed in **three containers**.

- Inner water-tight box, containing the sample;
- A second water-tight box, containing enough absorptive material between this second box and the first box, to absorb all the fluids of the sample, in case of leakage of first box;
- Outer shipping package, protecting the secondary box from outside influences, such as physical damage and water.

Specimen data forms, letters and possible other info regarding specimen, shippers and consignee identification should be taped outside the second container.

- For **"Diagnostic specimens"**: → **-Blood samples on filter paper.**
  -Skin-snip; Liver biopsy (*2)

Packaging:

Basic triple packing needs to meet the packaging instruction (PI) 650.

Primary receptacles may contain up to 500 ml each, the total volume in the outer package may NOT exceed 4L.
Note:
The packing materials in "module SAMPLING & Assessment " of the Ebola Kit, do meet the required specifications.

Labelling of outer packaging:

A label with following information is required:

- name, address and telephone number of consignee;
- name, address and telephone number of shipper;
- the statement "*Diagnostic specimen, Not Restricted, Packed in Compliance with Packing Instruction 650."*

The infectious substance label (biohazard) is NOT required.
UN specification marking is NOT required.

Required shipping documents:

- **Packing list & pro forma invoice**, including following info:

Number of boxes; details of contents; consignee address; sender address; weight (optional); value (even for samples without value → mark "no commercial value").

The shipper's declaration of dangerous goods is NOT required.

- **Airway bill** (if shipped by air)

- **Copy of specimen data forms**, letters, and possible other identification data:

1 copy must be attached on the outside of the second container.

1 copy to be sent (by air mail) to receiving laboratory.

1 copy stays with sender.

- For **"infectious substances"** → **- Liquid Blood In vacutainer** (*1)**.**

Packaging:
The basic triple packaging needs to meet with the UN class 6.2 specifications and packaging instruction (PI) 602.
The maximum net quantity of infectious substances in outer shipping package is 50 ml or 50g for passenger aircraft and 4L / 4Kg for cargo plane or other carriers.

Labelling:
A label with following information is required:

- name, address and telephone number of consignee;
- name, address and telephone number of shipper;
- UN number and proper shipping name;
- Temperature storage requirements (optional)

The infectious substance (**biohazard**) **label** has to be put on the outer packaging.
If Packaging exceeds 50mL or 50g, 2 package orientation labels (arrows) indicating the UP side must be placed.

Required shipping documents:

- The **Shipper's Declaration for Dangerous Goods**;
- Packing list & pro forma invoice and airway bill (as described above);

- **Copy of specimen data forms**, letters, and possible other identification data:

1 copy must be attached on the outside of the second container.
1 copy to be sent (by air mail) to receiving laboratory.
1 copy stays with sender.

NOTE:
1. Hand carriage and use of diplomatic pouches of infectious substances is strictly prohibited by international air carriers.

4. REQUIREMENTS FOR AIR MAIL:

Both Infectious substances and diagnostic specimens may be shipped by registered air-mail.

Requirements for both:
Basic triple packaging system conforms to Infectious substances or diagnostic specimens requirements.
Green Customs Declaration Label for Postal Mail (international mail)
Address label must display the word "LETTRE"

Requirement for diagnostic specimens: Violet UPU "Perishable Biological Substances" label.

Requirements for infectious substances: Biohazard label and shipper's Declaration of Dangerous goods.

(*1) Shipping should normally be done under "Infectious substances" regulations, however, an agreement between IATA and WHO exists which allows to send blood samples under "diagnostic specimens" as long as one is not sure that it contains the Ebola virus.

(*2) : Skin-snips and liver biopsy samples inactivated in 10% formalin are not infectious any more. They could thus be sent by normal mail, but preferably send them under "diagnostic specimen" regulations.