**Ebola Virus Disease**

**Temperature required:** -80 degrees C. Long term storage. Device is intended to be used as a stationary passive container to store vaccines for a period of minimum 35 days before recharge with icepacks.

### Sample Collection
- Blood & Nasopharyngeal samples

### Diagnosis
- Rapid Diagnostic Test (RDT)
- Polymerase Chain Reaction (PCR)
- Immunoassay
- Several tests under WHO EUAL

### TECHNICAL DESCRIPTION
- **Surveillance**
  - Sample Collection: Triple packaging boxes
  - Diagnostic: Handheld battery-powered electronic instrument designed to estimate body temperature of a site on skin (e.g. forehead) non-invasively, quickly without touching. A sensor can be cleaned easily by each use with wiping by disinfectant or sterilisable cover.

### Travel & Trade
- Temperature screening at airports/entry points of affected countries

### Vaccine
- On outbreak-specific basis, consider: rVSV-EBOV under Expanded access use. Please refer to SAGE Recommendations

### Infection Protection & Control (IPC)
- Personal Protective Equipment (PPE) for screening (standard), and first exposure

### Treatment
- Supportive treatment
- Investigational antiviral and/or monoclonal antibody under MEURI to reduce mortality
- IV Fluids critical
- Pain & Fever

### Personal Protective Equipment (PPE)
- PPE for Treatment in Healthcare Facilities for blood-borne pathogens.

### CASE MANAGEMENT
- Isolated patients must be placed in intensive care and receive supportive treatment. Aetiological treatment available only under compassionate use or research protocol

### Surgeries
- Criteria for selection of specific diagnostic tests may include historical efficacy, adherence to any existing Target Product Profiles, ease of use, necessary throughput, distribution and logistics requirements, and manufacturer production capacity. For some pathogens, consideration may need to be given to the presence of mutations in targeted gene sequences or proteins. WHO can advise on the selection of tests on a case by case basis as determined by a specific event.

### Key outbreak control activities considered for material supply
- **Surveillance**
  - Sample Collection: Triple packaging boxes for transport

### Interventions
- **Technological Description**
  - Guidance on regulations for Transport of Infectious Substances 2017 - 2018
  - Interim Guideline

### PPE Guidelines
- PPE - Standard
- Personal Protective Equipment (PPE) for Treatment in Healthcare Facilities for blood-borne pathogens. (See PPE Guidelines link)

### Note: Products for Surveillance, Prevention & Control, and Case Management are undergoing rapid and continuous development and refinement. For greater clarity, please refer to most recent applicable WHO technical guidance.

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### Operational Support & Logistics

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**EUVirus Disease**

**Agent's Biosafety Level:** BSL4

**Epidemic Potential:** Urban - high, Rural - medium

**Last Updated:** 21 September 2018

**Managing Epidemics Handbook**

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**SAMPLE COLLECTION**

- Temperature screening at airports/entry points of affected countries

**TREATMENT**

- Supportive treatment
- Investigational antiviral and/or monoclonal antibody under MEURI to reduce mortality
- IV Fluids critical
- Pain & Fever

**DIAGNOSIS**

- Several tests under WHO EUAL

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

- PPE for screening (standard), and first exposure

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**Note:** Many diagnostics supplies are also used for Case Management purposes, but have been included only in Surveillance. Emergency Use Assessment & Listing (EUAL)
## PREVENTION & CONTROL

### Personal Protective Equipment (PPE)

#### Gowns
- Single-use, fluid-resistant, disposable, length mid-calf to cover the top of the boots.
- Liquid-resistant, elastic cuff to anchor sleeves in place.

#### Gloves, heavy duty
- Covering forearm. Fabric: cotton or polyester, rubber coating, waterproof, and acid resistant, minimum cuff length 150mm.

#### Goggles, protective
- Good seal with the skin of the face. Flexible PVC frame to easily fit with all face contours with even pressure. Enclose eyes and the surrounding areas.
- Accommodate wearers with prescription glasses, Clear plastic lens with fog and scratch resistant treatments. Adjustable band to secure firmly so as not to lose its shape during clinical activity. Indirect venting to avoid fogging. May be re-usable (provided appropriate arrangements for decontamination are in place) or disposable.

#### Scrubs, tops
- Tunic/tops, woven, scrub, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.

#### Scrubs, pants
- Trousers/pants, woven, scrub, reusable or single use, short sleeved (tunic/ tops), worn underneath the coveralls or gown.

### Suruits

#### Apron, heavy duty, non-woven
- Straight apron with bib. Fabric: 100% polyester with PVC coating, or 100% PVC, or 100% rubber, or other fluid resistant material. Waterproof. Sewn strap for neck and back fastening.
- Minimum basis weight: 300g/m2
- Covering size: 70-90 cm (width) X 120-150cm (height)
- Reusable (provided appropriate arrangements for decontamination are in place)

#### Boot, rubber
- Non-slip sole pattern, PVC or polyurethane sole which is completely sealed and waterproof. Knee-high in order be higher than the bottom edge of the gown.
- Range of sizes available to improve comfort and avoid trauma to the feet. Materials of construction include rubber, PVC, neoprene, nitrile, polyurethane. Favor light colours to better identify possible contaminations.

#### Biohazardous bag
- Disposable bag for bio-hazardous waste, 30x50cm, with “Bio Hazard” print, autoclavable polypropylene.

### Aetiological Treatment

#### Treatments (eg. Antivirals and monoclonal antibodies)
- On outbreak-specific basis, consider: investigational therapeutics for consideration under Monitored Emergency Use of Unregistered and Investigational Interventions (MEURI).
## Ebola Virus Disease

### CASE MANAGEMENT

<table>
<thead>
<tr>
<th>Supportive Treatment</th>
<th>Compound Sodium Lactate Solution</th>
<th>Infusion giving set</th>
<th>Paracetamol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compound solution of sodium lactate (Ringer's lactate), injection solution, w/o IV set and needle, sterile, single-use</td>
<td>Infusion giving set, with air inlet and needle, sterile, single-use</td>
<td>Paracetamol, 500mg, tablets</td>
</tr>
</tbody>
</table>

### PPE Health Care Facilities

<table>
<thead>
<tr>
<th>Supportive Treatment</th>
<th>Gloves, examination</th>
<th>Face shield</th>
<th>Gloves, surgical, length to forearm large (longer than examination gloves)</th>
<th>Coverall</th>
<th>Face mask, particulate respirator, grade N95 or higher</th>
<th>Mask, surgical</th>
<th>Scrubs, tops</th>
<th>Scrubs, pants</th>
<th>Gown</th>
<th>Head cover</th>
<th>Boot, rubber</th>
<th>Goggles, protective</th>
<th>Apron</th>
<th>Bio-hazardous bag</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gloves, examination, nitrite, powder-free, non-sterile. Cuff length preferably reach mid-forearm (eg. minimum 280mm total length. Sizes, S, M, L Outer glove should have long cuffs, reaching well above the wrist, ideally to mid forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls.</td>
<td>Made of clear plastic and provides good visibility to both the wearer and the patient. Adjustable band to attach firmly around the head and fit snugly against the forehead. Fog resistant (preferable). Completely cover the sides and length of the face. May be re-usable (made of robust material which can be cleaned and disinfected) or disposable.</td>
<td>Gloves, surgical, nitrite, powder-free, single use. Outer glove should have long cuffs, reaching well above the wrist, ideally to mid forearm. Inner glove should be worn under the cuff of the gown/coveralls (and under any thumb/finger loop) whereas the outer glove should be worn over the cuff of the gown/coveralls. Sizes 5 to 8.5</td>
<td>Single use, light colours preferable to better detect possible contamination, thumb/finger loops to anchor sleeves in place, good freedom of movement. Sizes: M, L, XL</td>
<td>Fluid resistant particulate respirator. Surgical N95 respirator or higher High fluid resistance. Good breathability. Internal and external faces should be clearly identified. Structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)</td>
<td>Medical/surgical mask, high fluid resistance, good breathability, internal and external faces should be clearly identifiable, structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)</td>
<td>Tunic/tops, woven, worn, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.</td>
<td>Trousers/pants, woven, scrub, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.</td>
<td>Single use, fluid resistant, disposable, length mid-calf to cover the top of the boots, light colours preferably to better detect possible contamination, thumb/finger loops or elastic cuff to anchor sleeves in place.</td>
<td>Single use, fluid resistant, adjustable and should stay securely in place once adjusted, facial opening constructed without elastic, cover reaches upper part of the gown</td>
<td>Non-slip sole pattern, PVC or polyurethane sole which is completely sealed and waterproof. Knee-high in order be higher than the bottom edge of the gown. Range of sizes available to improve comfort and avoid trauma to the feet. Materials of construction include rubber, PVC, neoprene, nitrile, polyurethane. Favor light colours to better identify possible contaminations.</td>
<td>Apron, disposable or single use, made of polyester with PVC-coated, or other waterproof material. Straight apron with bib, minimum basis weight: 250g/m², waterproof. Covering size: 70-90 cm (width) X 120-150cm (height), or standard adult size</td>
<td>Disposal bag for bio-hazardous waste, 30x50cm, with &quot;Bio Hazard&quot; print, autooclavable polypropylene. 50 or 70 micron thickness</td>
<td></td>
</tr>
</tbody>
</table>

### Supportive Treatment

- **Infusion giving set, with air inlet and needle, sterile, single-use**: 100ml
- **Compound solution of sodium lactate (Ringer's lactate), injection solution**: 1000ml
- **Disposal bag for bio-hazardous waste, 30x50cm, with “Bio Hazard” print**: Autoclavable polypropylene.

### Operational Support & Logistics

- **EBOLA VIRUS DISEASE**

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**OSL | Disease Commodity Packages**

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**CASE MANAGEMENT**

- **Supportive Treatment**
  - Gloves, examination
  - Face shield
  - Coverall
  - Face mask, particulate respirator, grade N95 or higher
  - Mask, surgical
  - Scrubs, tops
  - Scrubs, pants
  - Gown
  - Head cover
  - Boot, rubber
  - Goggles, protective
  - Apron
  - Bio-hazardous bag

**Supportive Treatment**

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  - Made of clear plastic and provides good visibility to both the wearer and the patient. Adjustable band to attach firmly around the head and fit snugly against the forehead. Fog resistant (preferable). Completely cover the sides and length of the face. May be re-usable (made of robust material which can be cleaned and disinfected) or disposable.

- **Coverall**
  - Single use, light colours preferable to better detect possible contamination, thumb/finger loops to anchor sleeves in place, good freedom of movement. Sizes: M, L, XL

- **Face mask, particulate respirator, grade N95 or higher**
  - Fluid resistant particulate respirator. Surgical N95 respirator or higher High fluid resistance. Good breathability. Internal and external faces should be clearly identified. Structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)

- **Mask, surgical**
  - Medical/surgical mask, high fluid resistance, good breathability, internal and external faces should be clearly identifiable, structured design that does not collapse against the mouth (e.g. duckbill, cup-shaped)

- **Scrubs, tops**
  - Tunic/tops, woven, worn, scrubs, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.

- **Scrubs, pants**
  - Trousers/pants, woven, scrub, reusable or single use, short sleeved (tunic/tops), worn underneath the coveralls or gown.

- **Gown**
  - Single use, fluid resistant, disposable, length mid-calf to cover the top of the boots, light colours preferably to better detect possible contamination, thumb/finger loops or elastic cuff to anchor sleeves in place.

- **Head cover**
  - Single use, fluid resistant, adjustable and should stay securely in place once adjusted, facial opening constructed without elastic, cover reaches upper part of the gown

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  - Good seal with the skin of the face. Flexible PVC frame to easily fit with all face contours with even pressure. Enclose eyes and the surrounding areas, Accomodate wearers with prescription glasses, Clear plastic lens with fog and scratch resistant treatments, Adjustable band to secure firmly so as not to become loose during clinical activity, Indirect venting to avoid fogging, May be re-used (provided appropriate arrangements for decontamination are in place) or disposable.

- **Apron**
  - Apron, disposable or single use, made of polyester with PVC-coated, or other waterproof material. Straight apron with bib, minimum basis weight: 250g/m², waterproof. Covering size: 70-90 cm (width) X 120-150cm (height), or standard adult size

- **Bio-hazardous bag**
  - Disposal bag for bio-hazardous waste, 30x50cm, with "Bio Hazard" print, autooclavable polypropylene. 50 or 70 micron thickness
## Ebola Virus Disease

### Health Logistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body bag</td>
<td>Made of linear enforced, U-shape zipper and 2 zipper pulls with tie ribs.</td>
</tr>
<tr>
<td></td>
<td>Adult size 250x120cm</td>
</tr>
<tr>
<td></td>
<td>Protector Body Bag specifications:</td>
</tr>
<tr>
<td></td>
<td>• 6 handles</td>
</tr>
<tr>
<td></td>
<td>• Impermeable, linear reinforced LLDPE, LDPE, EVA, PEVA, (avoid PVC), minimum thickness 400 microns;</td>
</tr>
<tr>
<td></td>
<td>• Should be able to hold 100-125 kilos (200-250 lbs),</td>
</tr>
<tr>
<td></td>
<td>• Should contain no chlorides: burning of chlorides pollute the environment and can cause damage to retort chambers. Body bags should be non carcinogenic to health of funeral workers when used for cremations.</td>
</tr>
<tr>
<td></td>
<td>• At least 6 handles included in the body bag to allow burial team to hand carry it safely</td>
</tr>
<tr>
<td></td>
<td>• Heat-sealed: insure superior strength and safety,</td>
</tr>
<tr>
<td></td>
<td>• Provide full containment of blood borne pathogens</td>
</tr>
<tr>
<td></td>
<td>• Cracking point of 25 - 32 degrees below zero</td>
</tr>
<tr>
<td></td>
<td>• Shelf life: minimum 10 years</td>
</tr>
<tr>
<td></td>
<td>• Bag and hands should be white color</td>
</tr>
<tr>
<td>Sprayer, hand-held</td>
<td>1.5 liters, acid resistant</td>
</tr>
<tr>
<td>Sprayer, backpack</td>
<td>12 liters, acid resistant</td>
</tr>
<tr>
<td>Chlorine</td>
<td>NaDCC, granules, 1kg, 65 to 70% + dosage spon</td>
</tr>
</tbody>
</table>