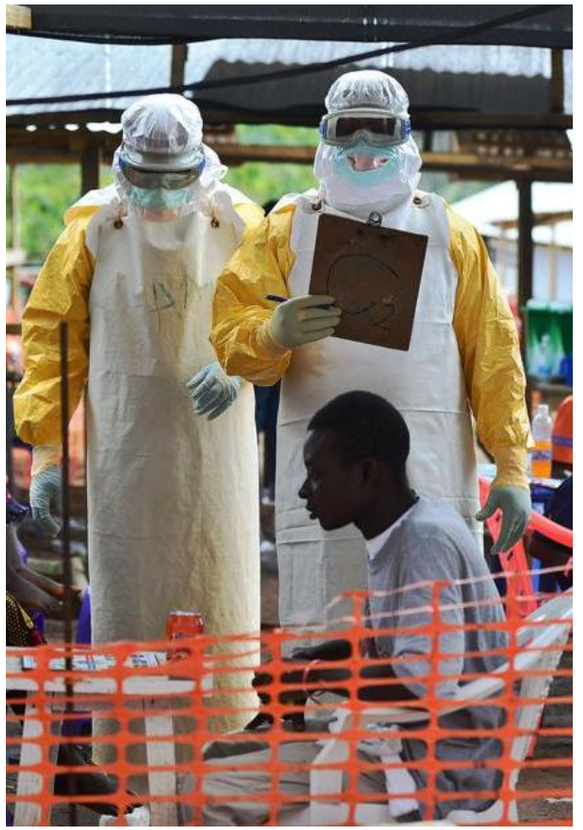
Ebola Virus Disease (EVD): Overview, Diagnosis & Clinical Management



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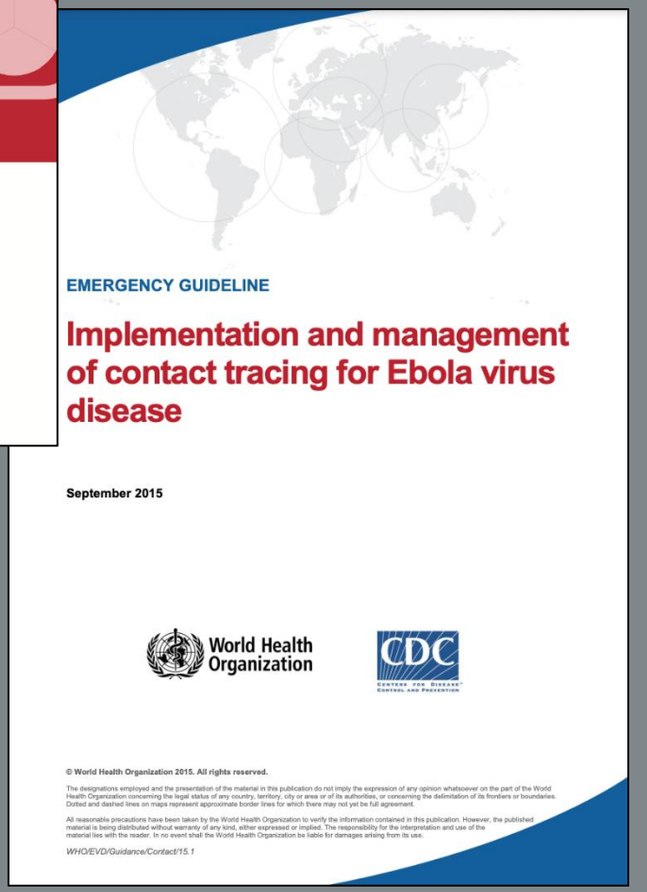
Outline

1. Introduction
2. UN Resources
3. Clinical & Lab Diagnosis
4. Contact Management
5. Clinical Management

Note: Complete WHO guidelines for the management of EVD patients can be found here:

Optimized Supportive Care for Ebola Virus Disease
https://apps.who.int/iris/handle/10665/325000

Implementation and management of contact tracing for Ebola virus disease
https://www.who.int/publications/i/item/WHO-EVD-Guidance-Contact-15.1



Introduction

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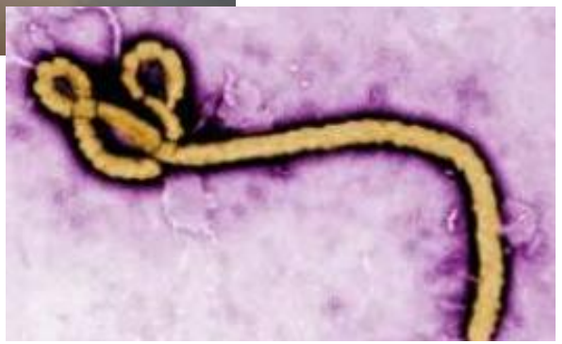


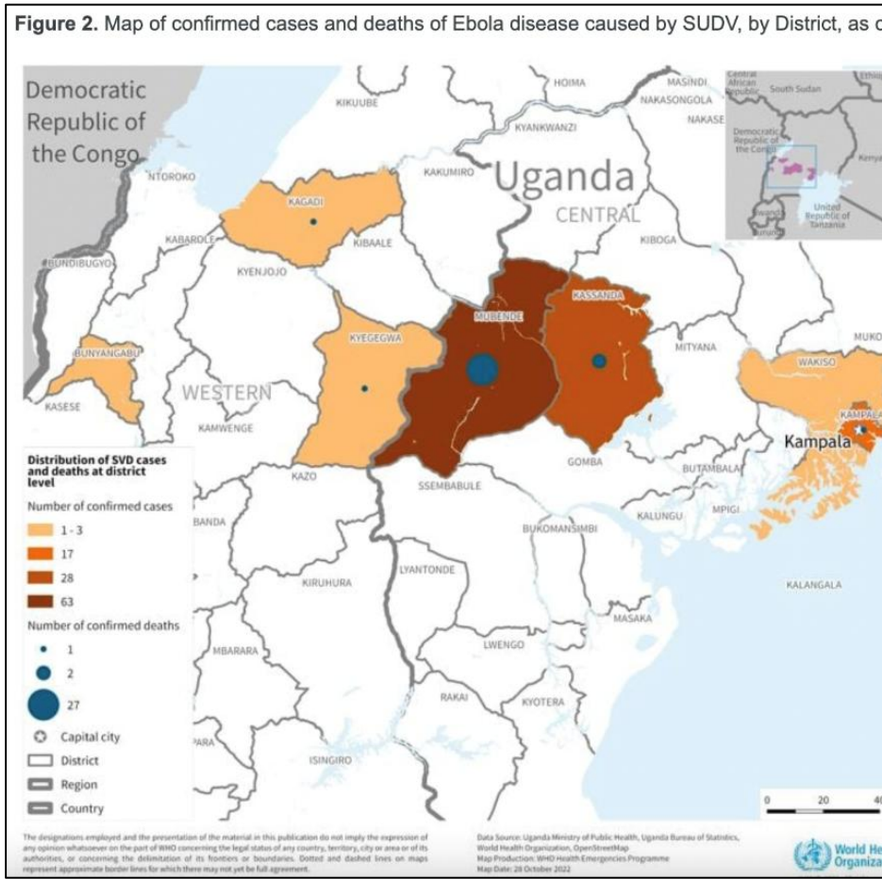
- First appeared in 1976 in 2 simultaneous outbreaks in South Sudan and DRC
- DRC outbreak occurred in a village near the Ebola River
- Virus family Filoviridae includes three genera: Cuevavirus, Marburgvirus and Ebolavirus
- Within the genus Ebolavirus, six species identified including Zaire and Sudan
- 2014-2016 outbreak in West Africa was the largest outbreak since – starting from Guinea and moving across to Sierra Leone and Liberia

Introduction

- Ebola virus disease, formerly known as Ebola haemorrhagic fever
- Fruit bats of Pteropodidae family are natural Ebola virus hosts
- Rare, but severe and often fatal illness in humans
- Transmitted from wild animals, and spread into human population through human-to-human transmission
- Average CFR is around 50% (range 25-90%)
- Community engagement key to successful control
- Case management, infection prevention and control practices, surveillance and contact tracing, good lab service, safe and dignified burials, mobilisation

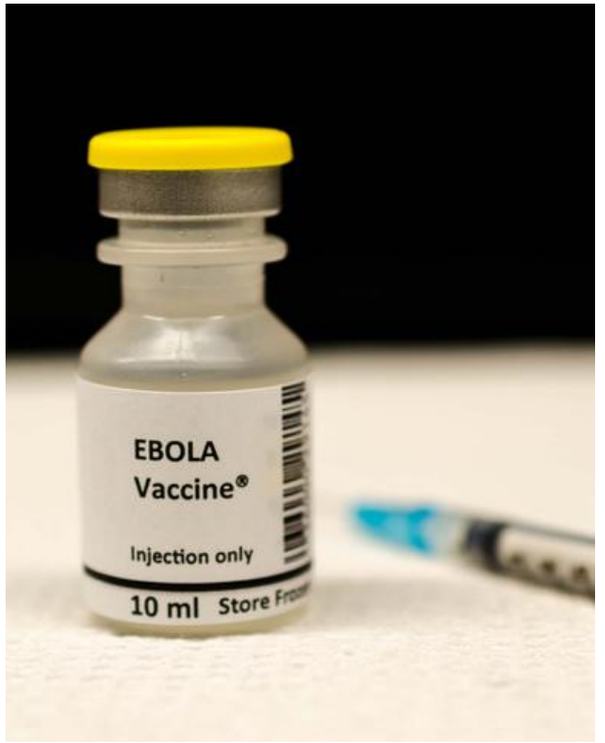
Current Outbreak in Uganda

- On 20 September, health authorities in the Republic of Uganda declared an outbreak of EVD caused by **Sudan ebolavirus (SUDV)**
- As of today, 2 November, there were:
  - Confirmed cases:**129**
  - Confirmed Deaths: **37**
  - CFR = **28%**
  - Recoveries: **43**
- This is not the first Ebola outbreak caused by the **Sudan** strain. 7 previous outbreaks have been reported, **four** of which occurred in Uganda and three in Sudan



Current Sudan Strain Has No Approved Vaccine

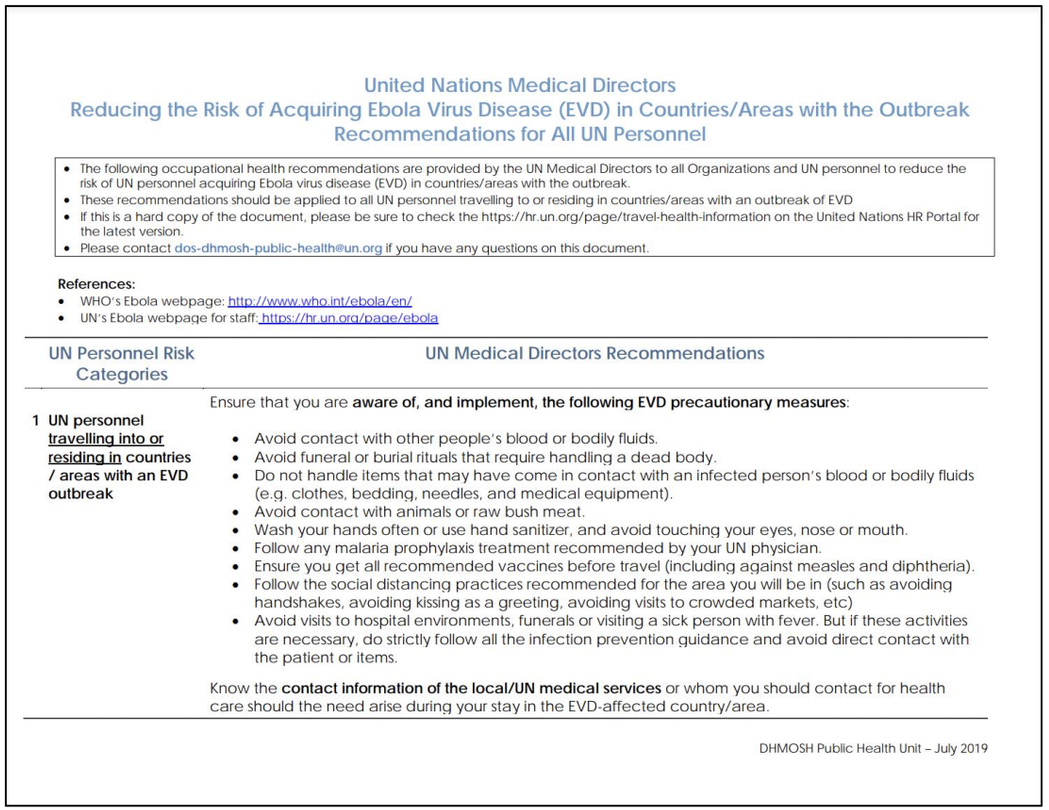
- EVD vaccine has only been approved to protect against the **Zaire** strain of Ebola
- **Three** candidate vaccines **may be trialed** but have yet to be specifically tested against the Sudan strain



Helpful UN Resources on EVD

UN Medical Directors' EVD Risk Mitigation Plan (English/French available)

https://hr.un.org/sites/hr.un.org/files/file/refmaterials/ID_Ebola_UNMDRMP_2021-08-%2027.pdf
https://hr.un.org/sites/hr.un.org/files/file/refmaterials/ID_Ebola_UNMDRMP_2021-08-%2027%20FR.pdf



United Nations Medical Directors
Reducing the Risk of Acquiring Ebola Virus Disease (EVD) in Countries/Areas with the Outbreak
Recommendations for All UN Personnel

- The following occupational health recommendations are provided by the UN Medical Directors to all Organizations and UN personnel to reduce the risk of UN personnel acquiring Ebola virus disease (EVD) in countries/areas with the outbreak.
- These recommendations should be applied to all UN personnel travelling to or residing in countries/areas with an outbreak of EVD
- If this is a hard copy of the document, please be sure to check the https://hr.un.org/page/travel-health-information on the United Nations HR Portal for the latest version.
- Please contact dos-dhmosh-public-health@un.org if you have any questions on this document.

References:
- WHO's Ebola webpage: http://www.who.int/ebola/en/
- UN's Ebola webpage for staff: https://hr.un.org/page/ebola

UN Personnel Risk Categories	UN Medical Directors Recommendations
1 **UN personnel travelling into or residing in countries / areas with an EVD outbreak**	Ensure that you are **aware of, and implement, the following EVD precautionary measures**: • Avoid contact with other people's blood or bodily fluids. • Avoid funeral or burial rituals that require handling a dead body. • Do not handle items that may have come in contact with an infected person's blood or bodily fluids (e.g. clothes, bedding, needles, and medical equipment). • Avoid contact with animals or raw bush meat. • Wash your hands often or use hand sanitizer, and avoid touching your eyes, nose or mouth. • Follow any malaria prophylaxis treatment recommended by your UN physician. • Ensure you get all recommended vaccines before travel (including against measles and diphtheria). • Follow the social distancing practices recommended for the area you will be in (such as avoiding handshakes, avoiding kissing as a greeting, avoiding visits to crowded markets, etc) • Avoid visits to hospital environments, funerals or visiting a sick person with fever. But if these activities are necessary, do strictly follow all the infection prevention guidance and avoid direct contact with the patient or items. Know the **contact information of the local/UN medical services** or whom you should contact for health care should the need arise during your stay in the EVD-affected country/area.

DHMOSH Public Health Unit – July 2019

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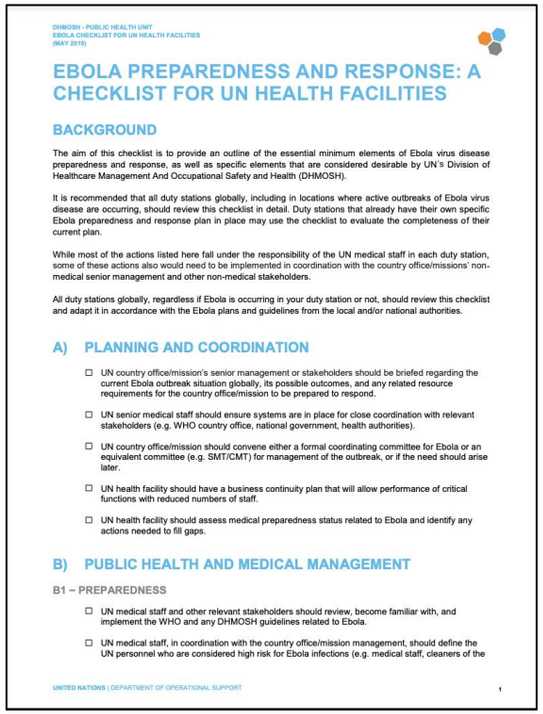
UN Ebola Preparedness and Response: A Checklist for UN Health Facilities (English & French available)

https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSHPH_2019-05_FINAL_Eng_2.pdf
https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSHPH_2019-05_FINAL_Fr_0.pdf



DHMOSH - PUBLIC HEALTH UNIT
EBOLA CHECKLIST FOR UN HEALTH FACILITIES
(MAY 2019)

EBOLA PREPAREDNESS AND RESPONSE: A CHECKLIST FOR UN HEALTH FACILITIES

BACKGROUND

The aim of this checklist is to provide an outline of the essential minimum elements of Ebola virus disease preparedness and response, as well as specific elements that are considered desirable by UN's Division of Healthcare Management And Occupational Safety and Health (DHMOSH).

It is recommended that all duty stations globally, including in locations where active outbreaks of Ebola virus disease are occurring, should review this checklist in detail. Duty stations that already have their own specific Ebola preparedness and response plan in place may use the checklist to evaluate the completeness of their current plan.

While most of the actions listed here fall under the responsibility of the UN medical staff in each duty station, some of these actions also would need to be implemented in coordination with the country office/missions' non-medical senior management and other non-medical stakeholders.

All duty stations globally, regardless if Ebola is occurring in your duty station or not, should review this checklist and adapt it in accordance with the Ebola plans and guidelines from the local and/or national authorities.

A) PLANNING AND COORDINATION

- ☐ UN country office/mission's senior management or stakeholders should be briefed regarding the current Ebola outbreak situation globally, its possible outcomes, and any related resource requirements for the country office/mission to be prepared to respond.
- ☐ UN senior medical staff should ensure systems are in place for close coordination with relevant stakeholders (e.g. WHO country office, national government, health authorities).
- ☐ UN country office/mission should convene either a formal coordinating committee for Ebola or an equivalent committee (e.g. SMT/CMT) for management of the outbreak, or if the need should arise later.
- ☐ UN health facility should have a business continuity plan that will allow performance of critical functions with reduced numbers of staff.
- ☐ UN health facility should assess medical preparedness status related to Ebola and identify any actions needed to fill gaps.

B) PUBLIC HEALTH AND MEDICAL MANAGEMENT

B1 – PREPAREDNESS

- ☐ UN medical staff and other relevant stakeholders should review, become familiar with, and implement the WHO and any DHMOSH guidelines related to Ebola.
- ☐ UN medical staff, in coordination with the country office/mission management, should define the UN personnel who are considered high risk for Ebola infections (e.g. medical staff, cleaners of the

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UN Guidance: PPE Stocks & Calculation of Quantities Needed

- Use the following **PPE calculator** to procure needed supplies: https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/calculator.html
- This calculator provides you the necessary **number** of individual PPE needed per VHF/EVD patient seen by your facility
- If you need training on how to use the EVD PPE Calculator, please watch this **training video** by DHMOSH Public Health at https://www.youtube.com/watch?v=EyJqhhLwgX4

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EVD Online Courses Conducted by WHO

ePROTECT Ebola (EN)	https://openwho.org/courses/e-protect
Ebola: Clinical management of Ebola virus disease	https://openwho.org/courses/ebola-clinical-management
Ebola: GO 2.0	https://openwho.org/courses/GO-en

Clinical and Lab Diagnosis

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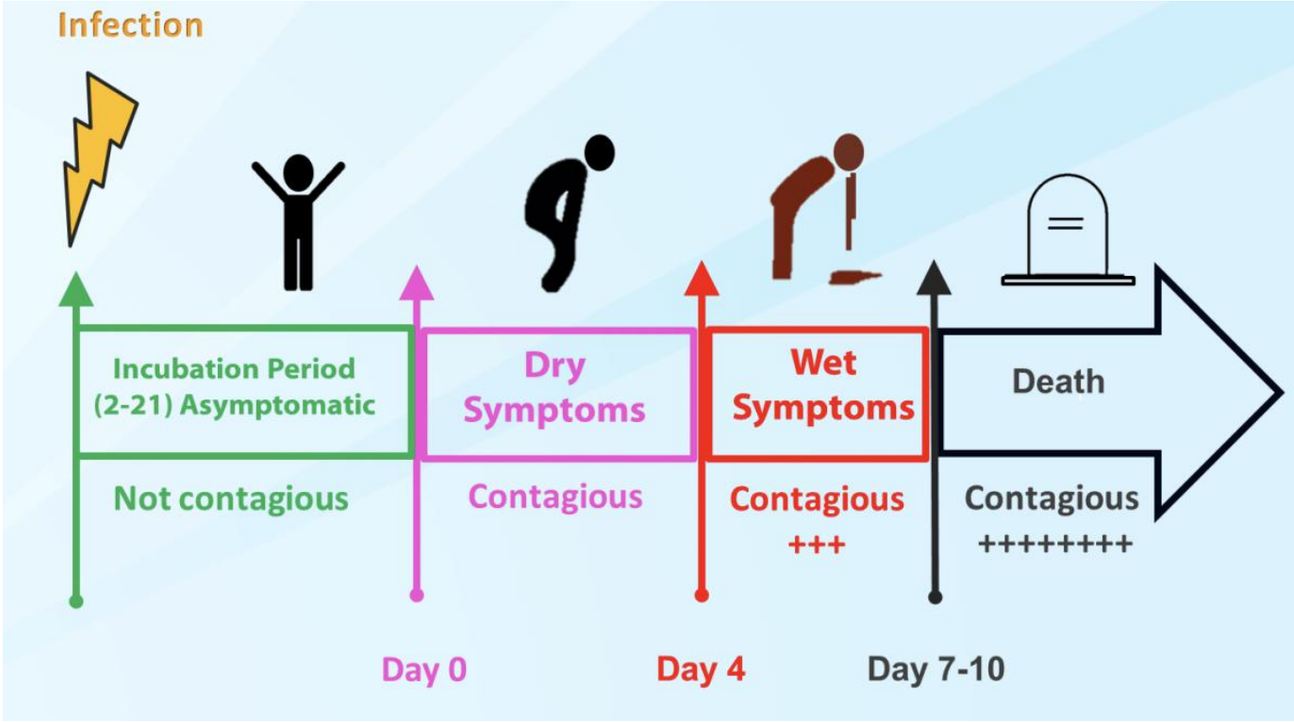
Signs & Symptoms of EVD

- **Can be sudden and include**:
  - Fever, fatigue, muscle pain,
  - Headache, sore throat

- **This is followed by:**
  - Vomitting, diarrhoea, rash, symptoms of kidney and liver function, internal and external bleeding (e.g. from gums or blood in stools.
  - Lab findings include low white blood cell and platelet counts and elevated liver enzymes

Disease Progression of EVD

- Not contagious until **symptoms** develop
- Wet symptoms develop approx. **day 4** of illness
- Patient becomes more and more **contagious** as the illness advances
- Without treatment, death occurs **7-10 days** after illness onset
- Amount of Ebola virus in the body is **highest** at the time of death



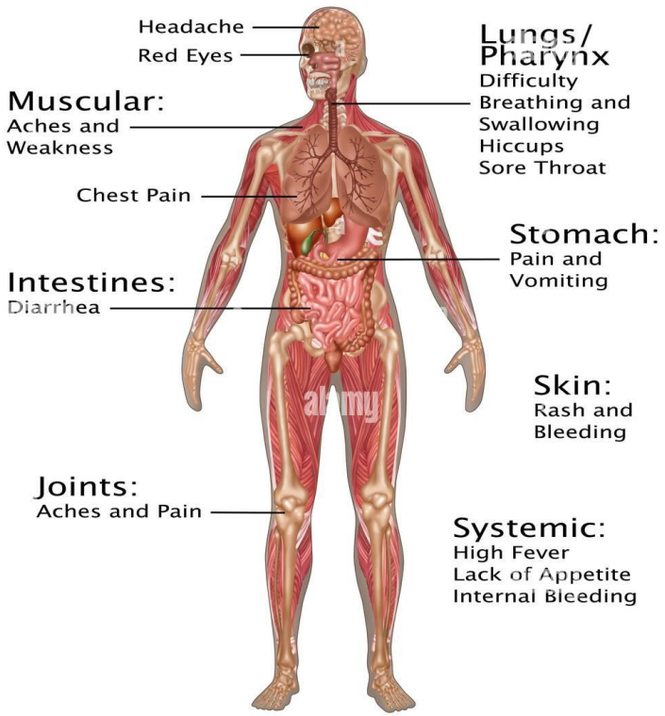
Suspect / Confirmed Case Definition

Suspect Case

- Signs and symptoms consistent with Ebola virus infection **AND**
- An epidemiological risk factor (exposure to blood or body fluids of infected person, objects contaminated from infected person, infected fruit bats or non-human primates, semen from a man recovering from Ebola)

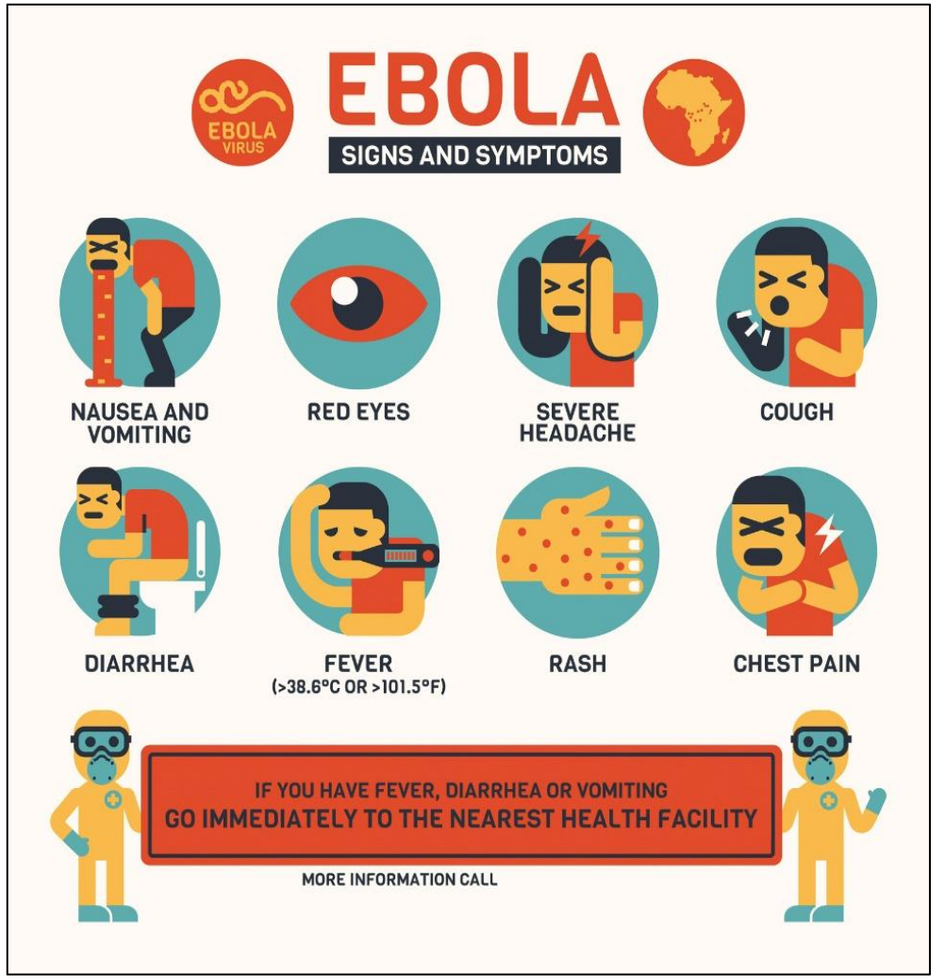
Confirmed Case

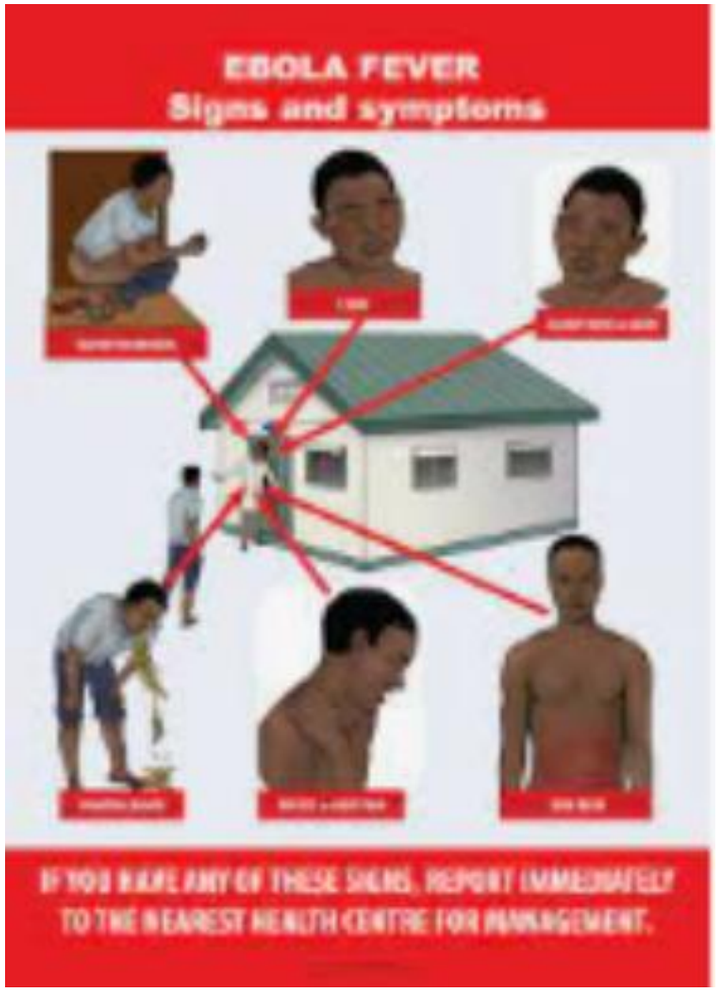
- Laboratory-confirmed diagnostic evidence of Ebola virus infection



Symptoms of **EBOLA**

Staff Awareness of Signs/Symptoms





Considerations for Clinical Diagnosis

- Signs and symptoms of SUDV are **similar** to other infectious diseases and conditions such as:
  - Malaria
  - Typhoid fever
  - Meningitis
  - Pregnancy
- Use proper precautions when testing due to possibility of **co-infection** with the above
- Pregnant women should be tested **rapidly** if Ebola is suspected

Confirmation of Diagnosis by Lab Testing

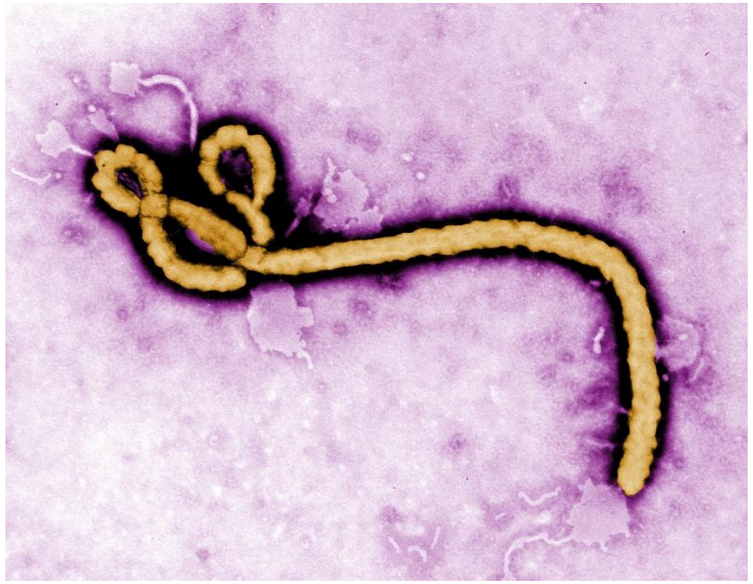
- Ebola virus is detected in blood **only after onset of symptoms**, most notably fever,
- However, it may take up to **3 days** after symptoms begin for the virus to reach detectable levels
- **Polymerase chain reaction (PCR)** is one of the most commonly used diagnostic methods because of its ability to detect low levels of Ebola virus.
- **WHO recommends PCR tests as gold standard for Ebola confirmation.**

What To Do for Test-Negative Suspect EVD Cases?

- PCR tests are **often negative in patients with symptoms less than 3 days**
- **Repeat the test at 72 or more** hours after onset of symptoms
- Keep patient in suspect area until a sample taken 72 hours after symptoms begin is negative
- Testing negative does not equal to having immunity
- **Repeat diagnostic testing** when indicated

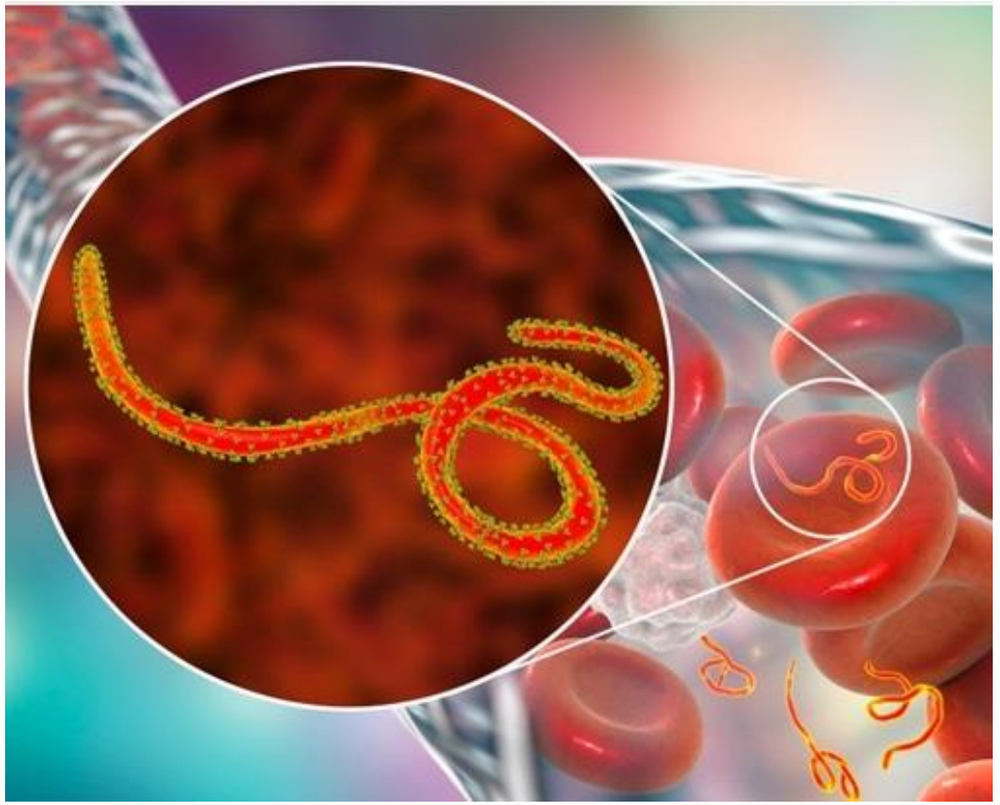
Confirmation of Diagnosis by Lab Testing

- According to WHO:
  - Rapid antigen detection tests can be used in remote settings where PCR tests are not readily available
  - However, such rapid tests are recommended only for screening purposes as part of surveillance activities
  - **If rapid antigen test is positive, it should always be confirmed with a PCR test**



Specimen Collection

- The preferred specimens for diagnosis include:
  - **Whole blood** collected in ethylenediaminetetraacetic acid (EDTA) from live patients exhibiting symptoms
  - **Oral fluid** specimen stored in universal transport medium collected from deceased patients or when blood collection is not possible



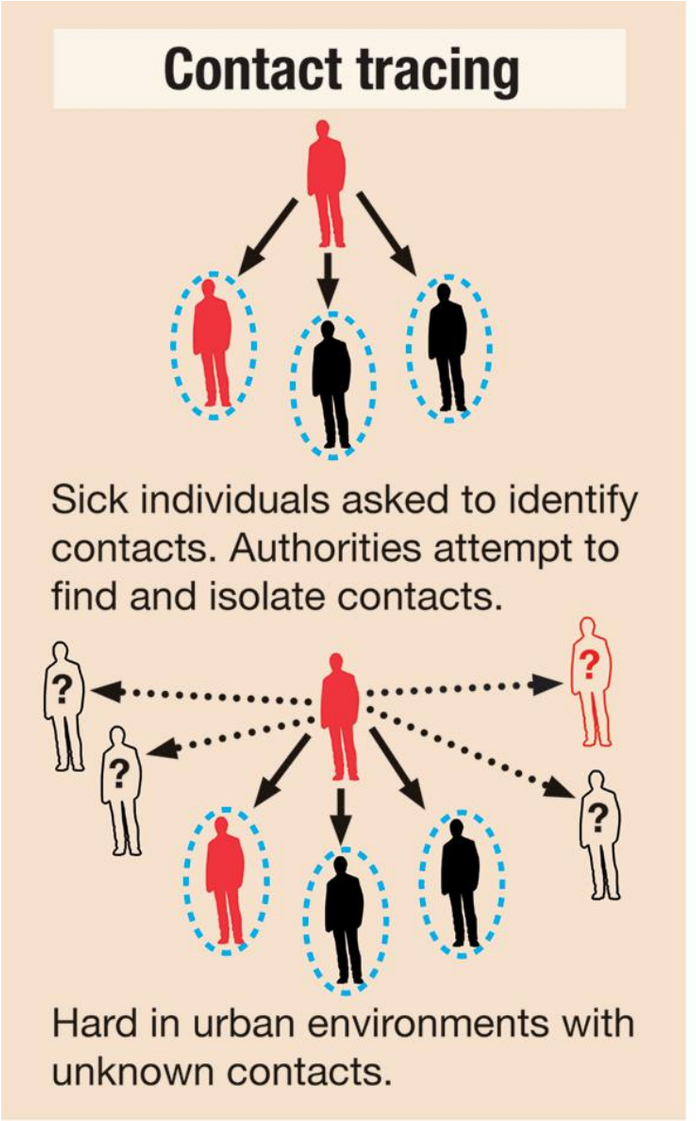
Specimen Collection & Transport

- **Blood and other samples from symptomatic EVD patients are highly infectious**
- All biological specimens should be packaged using the **triple packaging system** when transported nationally and internationally
- Laboratory testing on non-inactivated samples should be conducted under **maximum** biological containment conditions

Contact Management

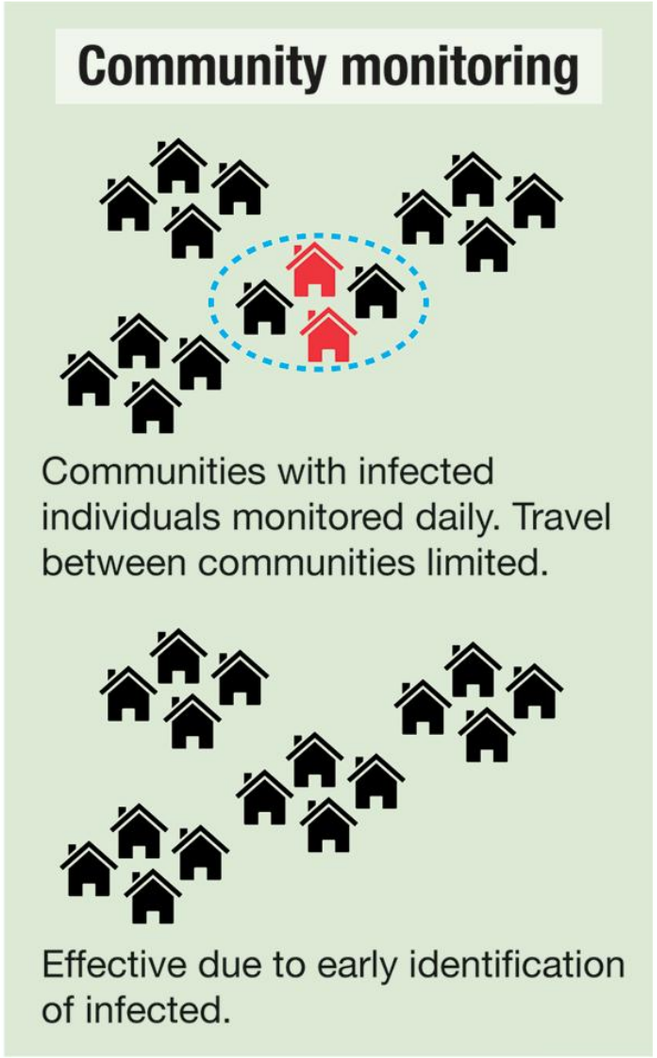
What To Do if Someone Has Been Exposed?

- If you're exposed, **immediately** clean the area with **soap and water** or in the case of mucous membrane exposure, clean with water
- Immediately **call your medical practitioner**, UN physician or your organisation's medical services for guidance
- At this time, there is **no vaccine available** for the Sudan ebolavirus (SUDV)
  - However, vaccines may be **trialed** for SUDV in the near future



What To Do if Someone Has Been Exposed?

- Assess for any other **blood borne virus (BBV)** exposure (HIV, Hep B, Hep C) and receive prophylaxis and counseling as appropriate.
- Monitor contacts daily for Ebola symptoms for **21 days** counting from the last day of exposure
- **Educate contacts** on signs and symptoms of Ebola, next steps if s/s present, and preventing transmission to family members
- Contacts **should not travel** until cleared by health officials
- **Local** guidelines should be followed



Clinical Management

Clinical Management

- **Predominantly supportive care**
- **Aggressively replace volume loss** from diarrhea, vomiting .etc
- **Oral hydration with ORS** (even if patient does not have diarrhea or vomiting)
- **IV resuscitation** with Ringer's lactate (contains some potassium)
- **Replace potassium and magnesium loss**, likely significant for patients with diarrhea
- There are **no approved therapies** specific for EVD Sudan virus

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Managing the Treatable Manifestations & Complications of EVD

- **Fever and pain**
  - Paracetamol (acetaminophen)
  - Do NOT use NSAIDs (concern for thrombocytopenia, bleeding)
  - Opioids (caution in hypotensive patients; may reduce gut transit in diarrhea)
- **Nausea and vomiting**
  - Promethazine, metoclopramide, ondansetron
- **Diarrhea**
  - Aggressive oral rehydration
  - IV hydration when possible for those unable to take orally
  - Role of anti-motility agents uncertain
- **Dyspepsia**
  - Cimetidine or omeprazole
- **Agitation**
  - Diazepam or haloperidol
- **Malaria** (empiric therapy for all, or treat rapid diagnostic test positives)
- **Bacterial co-infections or gut translocation**
  - Empiric antibiotic therapy aimed at gut pathogens (e.g., cefepime)

WHO's Guidelines on EVD Clinical Management

1. Systematic assessment and re-assessment of all Ebola patients
2. Fluid resuscitation
3. Electrolyte monitoring and correction
4. Glucose monitoring and management
5. Treatment of potential co-infections
6. Nutrition
7. Symptomatic care and prevention of complications
8. Management of complications

*The main **priority** is to transfer patients to a location where they can receive supportive care.*

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Systematic assessment and Re-assessment of all EVD Patients

- Staffing ratio of **1** or more clinicians for **4** patients
- Assessments (evaluation of each patient) performed at least **3** times per **24 hours**
- **Close monitoring** of patients to allow recognition of and reaction to acute changes in condition

Systematic Assessment and Re-assessment of all EVD Patients

- Identification of patients at **high risk** for complications, including:
  - Low systolic blood pressure (SBP) in either adults or children or delayed capillary refill and cold extremities in a child
  - Altered mentation, delirium or seizure
  - Tachypnea (fast respiratory rate)
  - Weak or rapid pulse
  - Oliguria (urine output < 0.5 ml/kg/hour in adults; < 1.0 ml/kg/hour in children) or
  - Anuria
  - Haemorrhagic manifestations
  - Severe hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)
  - SpO2 < 92%
  - Severe electrolyte, metabolic, acid-base abnormalities
  - Severe vomiting and/or diarrhoea
  - Severe weakness with inability to ambulate or eat/drink
- **Resuscitation** should be initiated
- Patients should be placed in the area of the treatment unit designated for the care of the **critically ill**

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WHO's Daily Assessment Checklist

Daily assessment checklist

Assessment	Plan
1. Is the patient at high risk of complications? a. Airway obstruction or respiratory distress? b. Tachypnea (RR > 22 or fast for age) or SpO_2 < 92%? c. Shock? Hypotension, weak or rapid pulse, cold extremities or delayed capillary refill? d. Signs of severe dehydration? e. Altered mentation or seizure? f. Oliguria or anuria, urine output < 0.5 (adult)/1.0 ml (child)/kg/hour? g. Haemorrhagic manifestations? h. Severe hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. Severe electrolyte abnormalities? j. Severe weakness with inability to ambulate or eat/drink?	❑ NOT at high risk Regular assessments – three times a day ❑ HIGH risk Increased interval of assessments: _____ ❑ Plan:_____
2. Fluid status assessment a. Able to drink normally? b. Able to drink some but not enough to correct dehydration or meet daily fluid requirements? c. Signs of sepsis or shock (HR > 90, SBP < 100, RR > 22). And for child: cold extremities, weak fast pulse, delayed capillary refill > 3 sec?	❑ Continue with oral fluids ❑ Add maintenance fluids ❑ Bolus IV fluids: _____ml
3. Laboratory assessment a. Does potassium or magnesium need to be replaced? b. Is renal failure present? i. If yes, has the patient been adequately fluid resuscitated? ii. Is a urinary catheter needed to monitor urine output?	❑ Replace potassium ❑ Replace magnesium ❑ Place a urinary catheter ❑ Use ultrasounds to assess fluid status
4. Severe hypoglycaemia a. Evidence of hypoglycaemia (glucose < 54 mg/dl or < 3 mmol/l)? i. If yes, are they symptomatic and require D50 or D10? ii. If no, are they able to eat and drink or do they require continuous infusion of D5 or D10?	❑ Euglycaemic ❑ D50 (adult) or D10 (child) for symptomatic hypoglycaemia ❑ D5 or D10 for asymptomatic hypoglycaemia
5. Treatment of potential bacterial co-infections a. Is the patient at high risk of co-infections? i. If yes, is the patient being treated with ceftriaxone? ii. If no, is the patient being treated with cefixime? b. Does the patient still need to be treated with antibiotics?	❑ Ceftriaxone ❑ Cefixime ❑ Antibiotics discontinued
6. Treatment of potential malaria a. Does the patient have signs of severe malaria? i. If yes, is the patient being treated with artesunate? ii. If no, is the patient being treated with an antimalarial medication? b. Can the antimalarials be stopped due to a negative malaria test?	❑ Artesunate ❑ Artesunate-amodiaquine (ASAQ) ❑ Malaria negative ❑ Malaria treatment completed
7. Nutrition a. Is the patient able to eat and drink? i. If yes, can maintenance fluids be stopped?	❑ Able to eat and drink ❑ NOT able to eat and drink and requires maintenance fluids
8. Prevention a. Can the IV line be removed? b. Can the urinary catheter be removed? c. Does the patient require assistance walking or can they walk on their own?	Remove IV line ❑ Yes ❑ No Remove urinary catheter ❑ Yes ❑ No Patient requires assistance walking ❑ Yes ❑ No
9. Is the patient a pregnant woman? a. Is she having an abortion? Premature birth? Has she had an incomplete abortion? If no, is the fetus viable?	Date of last menstrual period: _____ Echo: _____ Plan: _____

Notes: D dextrose; HR heart rate; RR respiratory rate; SBP systolic blood pressure; SpO_2 oxygen saturation.

Fluid Resuscitation

- Patients with Ebola often present with or develop **one or more** of the following:
  - Volume depletion (dehydration), sepsis, haemorrhage and/or shock
- Management:
  - **Oral** rehydration in patients who can drink
  - **Intravenous** administration in those who are unable to drink or who have severe dehydration or shock

Electrolyte Monitoring and Correction

- Complete **daily labs** during acute phase of illness and haematology on admission and as needed
- Ensure appropriate and timely correction of **electrolyte abnormalities**, including:
  - Hypokalaemia, hyperkalaemia, hypomagnesemia, hypocalcaemia, hyponatraemia, hypernatraemia

5. ELECTROLYTE MANAGEMENT

The following topics are covered in this section: hypokalaemia, hyperkalaemia, hypomagnesemia, hypocalcaemia, hyponatraemia, hypernatraemia.*(6)*

5.1 Hypokalaemia

Hypokalaemia is a dangerous complication that is associated with arrhythmias and/or death, but repletion must also be done carefully.

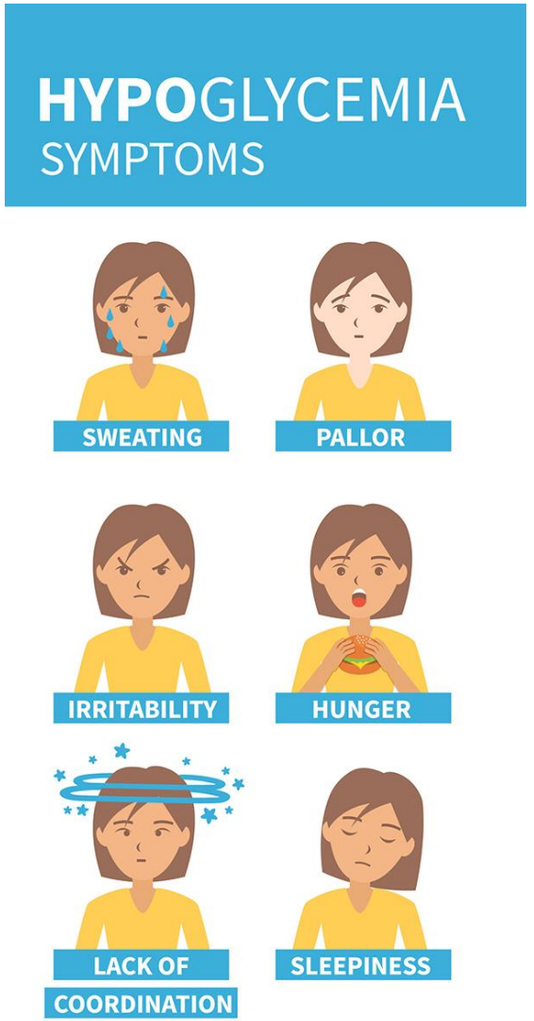
- When tolerated (not vomiting) oral potassium should be used.
- **Never give potassium IV as bolus.**
- **Adults:** the maximum rate of IV potassium through a peripheral IV line is 10 mmol/hour. The maximal concentration is 10 mmol per 100 ml.
  - » If a central venous catheter is in place, it can give up to 20–40 mmol/hour, administered as 20–40 mmol in 1 litre NS while on a cardiac monitor.
- **Children:** the maximum IV infusion rate is 0.5 mmol/kg/hour through a peripheral IV or central line.
  - » The maximum concentration of IV potassium through a peripheral line in children is 10 mmol/l.
- It is preferable to infuse potassium using an electric syringe pump to ensure rate.
- Every 0.1 mmol reduction in serum requires approximately 10 mmol KCl repletion in adult patients.
- Every 1 g of potassium in a 10 ml ampoule is equivalent to 13.4 mmol or 13.4 mEq of potassium.

Potassium level	Adult dosing
3.3–3.5	40 mmol oral dose. Re-check serum K level and repeat dose if needed.
2.5–3.2	60–80 mmol oral dose. Re-check serum K level and treat if necessary.
< 2.4 (severe)	10 mmol per hour IV/ for 4 hours. Re-check serum K level. Give additional dose at 2–4 hours, if still needed. Always re-check serum K level between dosing.
	Paediatric dosing
K 2.5–2.9 mmol/l	0.5–1.0 mmol/kg oral dose. Re-check serum K level. Can repeat every 6–12 hours. Can repeat to a total of 2–4 mmol/kg/day in 2–4 divided doses.
K < 2.5 mmol/l	0.5 mmol/kg/hour IV for 2 hours + 2 mmol/kg oral dose. Re-check serum K level. Can repeat every 12 hours.

Detailed guidance on electrolyte management can be found in WHO Optimized Supportive Care for Ebola Virus Disease found here.

Glucose Monitoring and Management

- **Hypoglycaemia** is frequently seen in patients with Ebola (especially infants and children) and should be managed to avoid complications
- Recommendations:
  - Serum glucose checked at least **3 times a day** with vital signs
  - **Intravenous (IV) glucose management** as needed

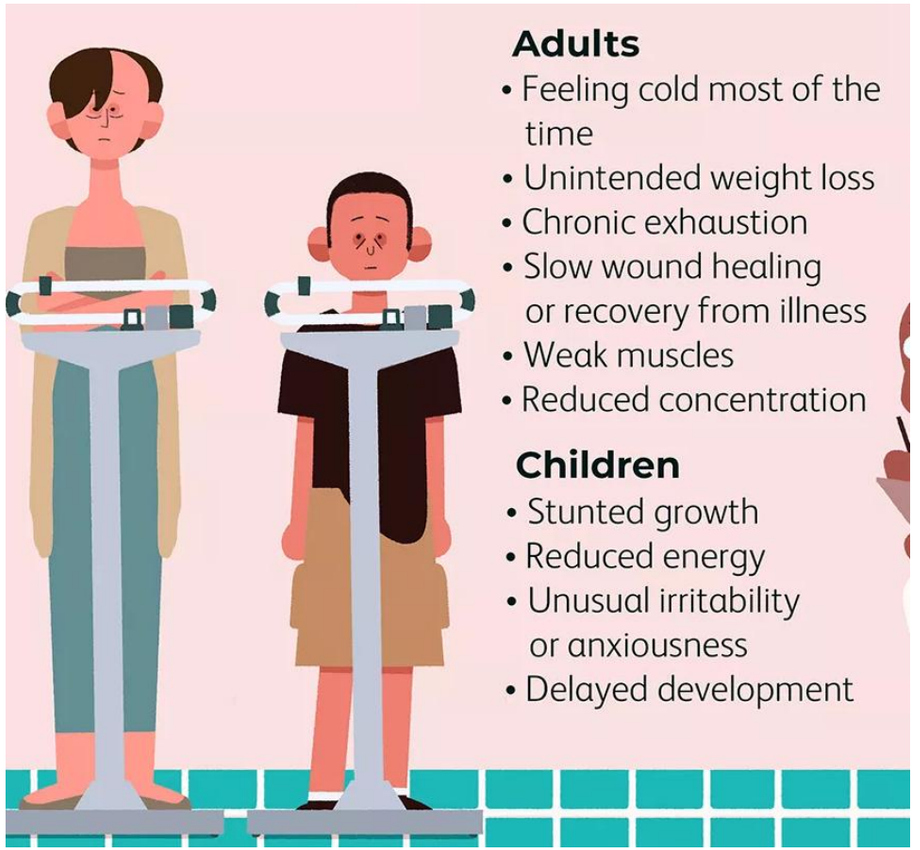


Treatment of Potential Co-infections

- Bacterial co-infection
  - **Empiric treatment** with antibiotics is recommended for patients with Ebola
- Co-infection with malaria
  - **Empiric antimalarial therapy** should be administered to all febrile patients with suspect and confirmed Ebola
  - **Stop treatment** once malaria testing is negative or the treatment course is finished.

Nutrition

- On admission, assess the **nutritional status** of all patients with Ebola, including:
  - Body weight, height, and in children, mid-upper arm circumference
  - Signs of malnutrition
  - Current appetite status
- **Enteral nutrition** should be provided and advanced as tolerated
- **IV dextrose** provided for patients that cannot take oral food and with evidence of hypoglycaemia



Prevention of Complications

- Feeding
  - Encourage **early enteral nutrition**
- Stress ulcer prophylaxis
  - Use of a **proton pump inhibitor** or **H2 receptor blocker** in critically ill patients at high risk of bleeding

Prevention of Complications

- **Early Mobility**
  - Assess patient **daily** for early mobility
  - Once patient is improving, then **encourage early mobility** and ambulation to prevent pressure ulcers and thrombotic events
  - **Provide assistance** for patient to sit up, dangle on side of bed, then to stand and walk
  - If unable to mobilize, turn patient in bed every **2–4 hours** to prevent pressure ulcers

Management of complications

- The complications of Ebola include:

Seizure	**Bleeding at the site of IV**
Altered mental state and encephalopathy	**Intracerebral haemorrhage**
Haemorrhage	**Acute renal failure/kidney injury**
Haematemesis	**Metabolic acidosis**
Haematochezia	**Hypoxic respiratory failure**
Vaginal bleeding	**Sepsis and septic shock**
Gingival bleeding	

DEPARTMENT OF OPERATIONAL SUPPORT

UN, WHO and CDC's EVD Resources

DHMOSH Ebola Resource Page	https://hr.un.org/page/ebola
UNMD Ebola Risk Mitigation Plan (July 2019)	https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSHPH_2019-05_FINAL_Eng_2.pdf
Ebola Preparedness And Response: A Checklist for UN Health Facilities (May 2019)	https://hr.un.org/sites/hr.un.org/files/Ebola%20Checklist_DHMOSHPH_2019-05_FINAL_Eng_2.pdf
PPE Calculator	https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/calculator.html
Ebola Virus Disease: Standard Precautions and How to Use EVD PPE Calculator [Video]	https://www.youtube.com/watch?v=EyJqhhLwgX4
Personal protective equipment for use in a filovirus disease outbreak (November 2016)	https://www.who.int/publications/i/item/9789241549721
Optimized supportive care for Ebola virus disease: clinical management standard operating procedures (2019)	https://apps.who.int/iris/handle/10665/325000
Implementation and management of contact tracing for Ebola virus disease (July 2015)	https://www.who.int/publications/i/item/WHO-EVD-Guidance-Contact-15.1
Manual for the care and management of patients in Ebola Care Units/Community Care Centres (Jan 2015)	https://apps.who.int/iris/bitstream/handle/10665/149781/WHO_EVD_Manual_ECU_15.1_eng.pdf

Questions?

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