World Health Organization

INTERIM GUIDANCE

Clinical care for survivors of Ebola virus disease

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Contents

Acronyms

AFB	Acid fast bacilli
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
CBC	Complete blood count
CSF	Cerebrospinal fluid
ETU	Ebola treatment unit
EVD	Ebola virus disease
GERD	Gastro-oesophageal reflux disease
IPC	Infection prevention and control
LFT	Liver function test
MOH	Ministry of Health
NSAID	Non-steroidal anti-inflammatory drug
PHQ-9	Patient health questionnaire 9
PPE	Personal protective equipment
PTSD	Post-traumatic stress disorder
PUD	Peptic ulcer disease
RDT	Rapid diagnostic test
RT-PCR	Reverse transcriptase-polymerase chain reaction
STI	Sexually transmitted infection
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WHO	World Health Organization

1. Introduction

Background

The outbreak of Ebola virus disease (EVD) that began in 2013 in West Africa had by December 2015, resulted in over 28,000 cases. Although estimates of the number of people affected during the outbreak vary, over 10,000 EVD survivors may require convalescent care. A number of both short- and long-term medical problems have been reported in EVD survivors, including mental health issues for both survivors and other family and community members (1-19). In addition, increasing recognition that Ebola virus may persist in selected body compartments of EVD survivors, most notably in the semen of males, brings awareness of the possibility of reintroduction of the virus in areas where transmission has previously been eliminated.

EVD survivors need comprehensive support for the medical and psychosocial challenges they face and also to minimize the risk of continued Ebola virus transmission, especially from sexual transmission. This document provides guidance on providing the necessary care and services for clinical care and virus testing, and should be used to guide the planning and delivery of ongoing health services to people who have recovered from EVD.

Target audience

The primary audience for this guidance includes health care professionals providing primary care to people who have recovered from EVD. This guidance may also be used by family or community members providing support and care to EVD survivors, as well as planners of health care services and policy makers.

Guidance development methods

This guidance was developed by the World Health Organization, Geneva, with inputs and feedback requested from stakeholders including Ministries of Health in Guinea, Liberia, and Sierra Leone; members of the UN Global Ebola Response Coalition; WHO country offices; research and non-governmental health organizations with recognized expertise and interest in the care of EVD survivors (Médecins-Sans-Frontières; Centers for Disease Control and Prevention (CDC), Atlanta (United States of America); US National Institutes of Health, Bethesda (United States of America); Partners in Health, Boston (United States of America); GOAL, Dublin (Ireland)) and other stakeholders.

Due to the severe limitations of the existing scientific evidence base on clinical care for EVD survivors and the urgent need for guidance on this topic, the recommendations in this document have been developed from consensus expert opinion amongst the stakeholders consulted. Although this severely limits the scientific robustness of the guidance, the document still remains a representation of best available practice and will be reviewed as new evidence comes to light.

The unprecedented scale of the West African EVD outbreak that began in 2013 has resulted in many more survivors and thus opportunities to vastly enhance clinical observations and understanding of the many health challenges they face. New findings also come from clinical observations made on the 27 patients with EVD seen in high-resource settings in Europe and North America, where available medical technology often permits more detailed and comprehensive investigation. New presentations and complications of EVD are discovered on almost a weekly basis and new findings continue to be anticipated as capacity to care for EVD survivors in West Africa continues to grow.

WHO will continue to follow the research developments in the area of EVD and health outcomes for survivors, particularly those related to areas where new recommendations or a change in this guidance may be warranted.

Updating the guidance

This guidance will be updated six months after publication, unless significant new evidence emerges which necessitates earlier revision. Comments or suggestions regarding additional issues for inclusion in the updated guidance are welcomed.

Definition of an EVD survivor

For the purposes of this document an EVD survivor is defined as a person:

- With a confirmed positive result on RT-PCR testing for Ebola virus on any body fluid who subsequently recovered

  AND/OR

- Who is IgM and/or IgG positive on serological testing for EVD and has not been vaccinated against Ebola virus

These definitions may be changed during an epidemic to correspond to the local situation on the ground. In most cases, government or laboratory-issued EVD Survivor's Certificates have been issued and should serve as the basis for verification of survivor status. However, cross-checking with ETU records and other databases and, in some cases, antibody testing, may be required.

Principle of integrated care

An intensive integrated program is necessary to address the medical and psychosocial needs of EVD survivors as well as the risk of virus reintroduction. Medical services for EVD survivors should ideally be integrated into existing routine health services and facilities. However, in areas where the necessary services do not exist or are inaccessible to EVD survivors, establishment of EVD survivor-specific services may be necessary. Regardless of the short-term approach to providing the needed urgent care to EVD survivors, the medium and long-term goals must be to strengthen health systems for all persons and for all health problems.

2. Planning follow-up of the EVD survivor

Prior to discharge from the ETU

After an EVD survivor's condition stabilizes, but prior to discharge from the ETU, he or she should receive education and counselling regarding the possible sequelae and psycho-social challenges faced during convalescence. With permission, it is ideal to include consultation with the survivor's close family members, explaining in simple terms the common sequelae and what is known about how Ebola virus can and cannot be transmitted during convalescence (see below under *Monitoring for persistent Ebola virus infection in survivors: Guidelines for testing and counselling*) and what measures they can take to avoid virus transmission (see below under *Infection prevention and control considerations in EVD survivors*). EVD survivors should be given a follow-up appointment to see a care provider within 2-weeks after discharge and specific instructions about who to contact if they encounter health problems or have questions. Issues such as confidentiality, avoiding stigmatization, and cost of follow-up care should be addressed. In cases when significant mental health problems are noted before discharge or anticipated afterwards, it may be appropriate to refer patients directly to a mental health care provider.

At discharge, EVD survivors should be provided with documents containing their unique patient ID, name, age, symptoms at presentation, and any convalescent symptoms at discharge, a brief record of their test results and treatment in the ETU, and their government or laboratory-issued EVD Survivor's Certificate. This information will serve as a 'transfer of care' document for their outpatient management. Survivors should be instructed to bring these documents, as well as documents recording past vaccination, to all future clinic or hospital visits.

Sexual health education and counselling should be offered to all EVD survivors, both male and female, at discharge and at follow-up visits. The potential for Ebola virus persistence in the semen and the measures to prevent transmission should be explained to male EVD survivors as well as their partners (see below under *Semen Testing and Counselling for Male EVD Survivors*). Pregnant survivors should receive counselling on the risks of Ebola virus-associated maternal and fetal complications as well as virus persistence and transmission (see below under *Considerations for special populations: Pregnant women*).

First visit after ETU discharge

The following should be performed at the first follow-up visit after discharge from the ETU (see detailed guidance by type of possible sequela below).

- General medical history and physical examination, including vital signs (temperature, blood pressure, heart rate, respiratory rate), and nutritional evaluation
- Musculoskeletal evaluation
- Ocular evaluation
- Auditory evaluation
- Abdominal evaluation
- Neurological evaluation
- Mental health evaluation
- Sexual health evaluation
- Consultation with social worker to address the following:
    - Stigma issues
    - Economic status and employment
    - Shelter and food security
    - Dependents
    - Social support (family, friends, religious community)

    - Potential substance misuse or dependency (alcohol, marijuana, cocaine, heroin and tobacco)
    - Identification of vulnerable individuals (children, disability, domestic abuse, etc.) for follow up/notification
- Routine laboratory tests:
    - Complete blood count
    - Creatinine
- Optional tests as indicated
    - Ebola RT-PCR or IgG or IgM antibody
    - Hepatic transaminases (ALT and AST) and amylase
    - Thyroid function tests
    - Erythrocyte sedimentation rate or C reactive protein
    - Pregnancy test
    - Malaria rapid diagnostic test
    - Stool examination for ova, cysts, and parasites
    - Urine dipstick for protein
    - Syphilis test (according to national guidelines)
    - HIV test (according to national guidelines)
        - Note: Due to anecdotal reports of EVD recrudescence in HIV positive survivors, some care providers recommend routine HIV testing with, pre- and post-test counselling of all EVD survivors.
- In regions with a prevalence of *Onchocerca volvulus* microfilaria infection >5%, ensure that patients are linked with the neglected tropical diseases eradication program for mass drug administration of ivermectin

All clinic visits made by EVD survivors and other relevant health information should be carefully charted and the records securely stored. Data collection forms specifically designed for follow-up of EVD survivors are available at: www.iddo.org/ebola/tools-resources.

Subsequent follow-up visits

Because some EVD sequelae may appear weeks or months after resolution of acute disease and persist for years, regular follow-up of survivors is recommended for at least one year, regardless of presence or absence of symptoms at discharge or initial outpatient evaluation. One suggested schedule for follow-up evaluation and care is as follows:

- Discharge from ETU
- Initial outpatient evaluation within 2 weeks, then
- Monthly follow-up for 6 months, then
- Follow-up every 3 months to complete one year
- Continued follow-up as needed and agreed upon by patient and care provider

The patient and care provider may wish to adjust this schedule based on the patient's particular condition and needs. Detailed evaluation similar to that described for the first visit post-ETU discharge should be performed at a minimum every 3 months for the first year. For males, follow-up visits should be coordinated with visits made for semen testing (see below under *Semen Testing and Counselling for Male EVD Survivors*).

3. Common sequelae of Ebola virus disease and recommended evaluation and clinical management

Musculoskeletal

Musculoskeletal pain, especially arthralgia, is one of the most commonly reported sequela, noted in 50-75% of survivors (2, 3, 8-10, 12, 16, 17). The arthralgia is generally symmetrical and polyarticular and worse in the morning and after exercise (9). The large joints are the most frequently affected, although any joint may be involved. Periarticular tenosynovitis (enthesitis) frequently affects the shoulders and hips and is consistent with a spondyloarthritis, especially when there is concomitant inflammatory eye disease (see below). Physical examination does not typically reveal abnormalities, although signs of inflammatory arthritis with swelling and tenderness are occasionally seen. Costochondritis (chest or rib pain) is also commonly noted.

Guidelines for clinical evaluation

- It is important to distinguish between non-inflammatory arthralgia (joint pain without other obvious abnormalities on physical exam) and inflammatory arthritis (joint pain with point tenderness, erythema, warmth, swelling, effusion, and/or limited range of motion).
- Radiographs are usually not indicated unless new deformities are noted.

Differential diagnosis of arthralgia/tenosynovitis

- Degenerative joint disease, autoimmune disease (such as rheumatoid arthritis or systemic lupus erythematosus)

Differential diagnosis of muscle pain

- Polymyositis, dermatomyositis, inclusion body myositis, rhabdomyolysis

Differential diagnosis of arthritis

- Septic joint (bacterial, such as staphylococci or gonococci, or TB), gout, pseudogout

Treatment of arthralgia/tenosynovitis and muscle pain

- Warm compresses
- Exercise can be beneficial and should be prescribed with caution on a case-by-case basis
- Address possible psychosocial issues that may be contributing
- First line therapy: Paracetamol
    - Adults: 1 gram orally up to 3 times daily (Note: It is recommended to limit paracetamol to 3 grams daily due to the possibility that EVD survivors incurred liver damage during their acute disease).
    - Children: 15 mg/kg orally up to 3 times daily
- Second line therapy (if inadequate response to paracetamol after 7-10 days): NSAIDS
    - Dosing:
        - **Adults:** Ibuprofen 200-400 mg orally up to 3 times daily. Other acceptable NSAID regimens include diclofenac 50 mg orally 2 or 3 times daily or naproxen 250-500 mg orally twice daily. Once daily NSAIDs such as meloxicam, piroxicam, celecoxib, and etodolac XL may also be substituted if available, although there is no evidence that they have greater efficacy than ibuprofen. Indomethacin should generally be avoided given the higher propensity for gastric complications.
        - **Children:** Ibuprofen 10 mg/kg orally up to 3 times daily

- Considerations:
    - NSAIDS may cause stomach upset and gastrointestinal bleeding and thus should be taken with food
    - If patient > 60 years old and/or has a history of PUD or GERD consider prescribing an H_2-blocker (e.g. ranitidine 150 mg orally twice daily) or a proton-pump inhibitor (e.g. omeprazole 20 mg orally daily for adults and as below for children):
        - <10 Kg: 1-2mg/Kg orally once a day
        - 10-20Kg: 10mg orally once a day
        - >20Kg: 20mg orally once a day
    - If patient ≥ 40 years old and/or hypertensive (BP > 140/90), check blood creatinine and potassium before starting NSAIDs and reduce dose if evidence of renal insufficiency. In such cases, consider relying on paracetamol if possible.
    - Check serum creatinine every 2-3 months if NSAIDs given for more than 2 weeks

Treatment of arthritis

- Arthritis without systemic illness (i.e. no fever or malaise): Warm or cold compresses, optional exercise, and NSAID therapy as described above
- If significant symptoms persist after 7-10 days of NSAID treatment and no other treatable cause is identified, stop NSAIDs and consider corticosteroids for adults and methotrexate for children:
    - Dosing:
        - **Adults:** Prednisone 20 mg orally daily for 7 days
        - **Children:** Refer to a specialist to consider treatment with methotrexate
    - Considerations for use of corticosteroids (adults):
        - Provide education about potential adverse effects, including mood changes, weight gain, elevated blood sugars, high blood pressure, and sleep disturbance
        - Consider and check for other underlying conditions and infections that could be exacerbated or reactivate with systemic corticosteroids, including diabetes, TB, and HIV/AIDS. Newly diagnosed HIV/AIDS patients should be started on antiretroviral treatment concomitantly with initiation of oral steroids. More details can be found at: www.who.int/hiv/topics/treatment
        - Since corticosteroid use can result in overwhelming infection with the helminth *Strongyloides stercoralis*, before starting prednisone empirically treat possible underlying *S. stercoralis* infection with one dose of ivermectin 200 micrograms/Kg orally, taken with water on an empty stomach. Note that ivermectin is considered contra-indicated in pregnant and lactating women.
        - Ask women of child carrying age about pregnancy, last menstrual period, and lactation status and, if in doubt, conduct a pregnancy test. Corticosteroid use in pregnant women is associated with an increased risk of birth defects, such as cleft palate, in the newborn (20, 21).
        - If the patient has a history of PUD or GERD consider prescribing an H_2-blocker (e.g. ranitidine 150 mg orally twice daily) or a proton-pump inhibitor (e.g. omeprazole 20 mg orally daily) for the duration of the steroid treatment
        - Follow patient after one week to monitor response to treatment and for adverse effects from oral corticosteroids, including:
            - Ocular side effects, such as worsening vision, increased intraocular pressure and cataract development
            - Hyperglycaemia, with urine or blood glucose monitoring as necessary

- Several clinical programs have incorporated community health workers and EVD survivor health advocates to monitor patients at home during the course of systemic corticosteroid therapy
- It should be noted that any effect of corticosteroid use on possible reactivation of Ebola virus from sites where it may persist is unknown (see below under *Relapse due to persistent virus and evaluation of new onset fever*).

Indications for referral to specialist

- Recurrent or persistent arthralgia that significantly impedes daily activities and quality of life and is refractory to at least 3 weeks of NSAID therapy and one week of prednisone therapy
- Spondyloarthropathy (i.e. spine and sacroiliac joint involvement)
- Arthritis with systemic illness or if suspicion of septic joint requiring aspiration, laboratory testing of aspirate and possible intravenous antibiotics
  - Joint aspiration should be performed using IPC precautions for EVD as described under *Infection prevention and control considerations in EVD survivors* below and the aspirate sent for RT-PCR test for Ebola.
  - If negative for Ebola, perform white blood cell count, gram and AFB stains, polarized light microscopy, and cultures for bacteria and TB as indicated and available
- Referral to a rehabilitation specialist may be required for survivors for people with prolonged musculoskeletal pain and fatigue

Ocular

Eye pain and redness, dry eyes, sensitivity to light, and blurry vision are common complaints among survivors (2, 3, 6-8, 10, 11, 22). Ocular sequelae, which include uveitis, cataracts, retinal and optic nerve disease, may appear during acute EVD or present at variable times after ETU discharge. Patients with uveitis have reported ocular symptoms up to 17 weeks after ETU discharge (23). Ocular disease in EVD survivors can be sight threatening and treatment outcomes may be time sensitive. Therefore, when ocular complaints arise, early treatment is essential. Early referral to an eye specialist should be considered where specialist services are available.

Guidelines for clinical evaluation

- Evaluate for eye pain, irritation or redness, increased tearing or dry eye, light sensitivity, and decreased visual acuity
- Test of visual acuity by Tumbling E chart Snellen chart: Check unilateral and bilateral at presentation and with best correction
- Pupillary exam, specifically testing for relative afferent pupillary defect
- Since preliminary evidence suggests that presence or absence of symptoms only moderately correlates with clinical disease, within the first month after ETU discharge, when possible all patients should be referred to an eye specialist for a full examination, including:
  - Dilated funduscopic exam
  - Slit lamp examination
  - Measurement of intraocular pressure

Differential diagnosis of eye pain/redness/irritation

- Bacterial, viral, or allergic conjunctivitis; dry eye syndrome; ocular surface disease from sunlight exposure; corneal ulcer, acute angle closure glaucoma; scleritis; trauma; uveitis due to other viruses

(herpes simplex, herpes zoster, and cytomegalovirus), parasites (*Toxoplasma gondii*) or bacteria (*Treponema pallidum*)

Differential diagnosis of decreased visual acuity

- Cataract; refractive error (presbyopia, myopia, hyperopia, and/or astigmatism); retinal scars from other pathogens (such as *Toxoplasma gondii, Treponema pallidum* [i.e. syphilis], *Onchocerca volvulus*, and measles virus); post-traumatic pathology (e.g. corneal scars, optic nerve damage, congenital disease, vitamin A deficiency); glaucoma; retinal detachment

Treatment of eye pain/redness/irritation

- When possible, exclude other infectious aetiologies such as syphilis and HIV through serologic testing of the blood
- If ocular surface disease suspected, treat with artificial tears for topical lubrication
- If uveitis suspected, immediate treatment is required, with immediate referral to an ophthalmologist or other eye care specialist where available. While referral is being arranged, the following treatment should be implemented:
  - Prednisone 1% eye drops every 1-2 hours (reduce as improvement) AND
  - Cyclopentolate 1% eye drops, 1 drop four times a day
- If no resolution after 7 days of topical prednisone and cyclopentolate, or if predominantly posterior/intermediate, or if panuveitis is suspected, consider adding systemic corticosteroids (adults) or methotrexate (children), following dosages and considerations as described under *Treatment of Arthritis* above.

Treatment of refractive error

- Prescribe and provide corrective lenses

Indications for referral to specialist

- Uveitis, especially suspected intermediate, posterior or pan-uveitis and all cases of uveitis that do not respond to 7 days of topical therapy as described above. These are medical emergencies for which oral corticosteroids (adults) or methotrexate (children) may be required.
- All children <10 years of age (since it may be difficult to ascertain a history of ocular symptoms in this group)
- Decreased vision or vision loss of any cause following EVD
- Pupillary abnormalities or optic nerve dysfunction (i.e. optic disc edema/swelling, optic nerve pallor)
- Referral to a rehabilitation specialist may be required for people with permanent or severe vision loss

Auditory

Tinnitus and hearing loss have been reported in over a quarter of EVD survivors, although the causal link between these findings and EVD remains to be determined (2, 3, 10, 11).

Guidelines for clinical evaluation

- Evaluate for hearing loss, tinnitus, aural fullness, and vertigo
- Otoscopic examination of ear canal and tympanic membrane

- Whispered voice screening test[1]
- Tuning fork tests (Weber and Rinne testing): 256 Hz and 512 Hz
- Audiometry testing (if available)
- Note: Children <10 years may not be able to report auditory sequelae and thus hearing tests, including audiometry if available, should be conducted in this group at each clinic visit.

Differential diagnosis of tinnitus and/or hearing loss

- Pre-EVD hearing loss due to diseases such as Lassa fever or auditory trauma
- Cerumen accumulation (i.e. “ear wax”)
- Acute viral labyrinthitis. The diagnosis is based on the acute development (< 10 days duration) of tinnitus, vertigo and hearing loss (ideally documented by audiometry, but manual evaluation with tuning forks or based on symptomatology may suffice).
- Otitis media (if accompanied by ear pain)

Treatment of acute labyrinthitis

- Note: Treatment of acute labyrinthitis is most efficacious when administered within 10 days (and ideally 72 hours) after symptom onset. Patients should therefore be educated upon ETU discharge to seek immediate medical attention if auditory symptoms develop.
- Acute labyrinthitis will often resolve on its own. The vestibular sedative prochlorperazine may be given to reduce vertigo while awaiting resolution:
  - Adults: 5-10 mg orally 3-4 times daily
  - Children, dose based on weight:
    - Under 10 kg: not recommended
    - 10-13 kg: 2.5 mg orally 1 or 2 times daily (do not exceed 7.5 mg per day)
    - 13-18 kg: 2.5 mg orally 2 or 3 times a daily (do not exceed 10 mg per day)
    - 18-39 kg: 2.5 mg orally 3 times daily or 5 mg 2 times daily (do not exceed 15 mg per day)
- Oral corticosteroids are sometimes prescribed for acute labyrinthitis, although their efficacy is unclear. Decisions to use corticosteroids for this condition should generally be left up to specialists in otolaryngology.

Treatment of otitis media

- Amoxicillin:
  - Adults: 250 mg orally 3 times daily for 10 days
  - Children, dose based on weight:
    - 40-90 mg/kg orally in 2 or 3 divided doses daily for 10 days
    - If over 40 kg, use adult dose

Indications for referral to specialist

- Persistent hearing loss or tinnitus necessitating audiometry if not otherwise available
- Need for ear wax removal or hearing aids
- Referral to a rehabilitation specialist may be required for people with permanent or severe hearing loss, as well as training resources on primary ear and hearing care

[1] Hearing screening software applications may be used as an alternative to voice tests when available.

Abdominal

Abdominal pain is common in EVD survivors but the cause is generally unknown.

Guidelines for clinical evaluation

- Ask regarding the presence of epigastric pain, reflux, blood or mucus in the stool, and rapid weight gain or loss
- Record the patient's weight and height
- Palpate and percuss the abdomen to assess for hepatomegaly, rebound or guarding (peritoneal signs), suprapubic tenderness, Murphy's sign (a sign of gallbladder disease consisting of pain on taking a deep breath when the examiner's fingers are on the approximate location of the gallbladder), and tympany (for ileus).
- Listen for decreased or hyper-active bowel sounds
- Stool examination for ova, cysts, and parasites as clinically indicated
- Abdominal imaging (ultrasound, abdominal plain films) as clinically indicated

Differential diagnosis

- Gastritis, GERD, PUD, irritable bowel syndrome, typhoid fever, helminthic or parasitic infection, diverticulitis, appendicitis, ovarian or testicular torsion, ectopic pregnancy, incarcerated hernias, intussusception (children < 6 years), pelvic inflammatory disease, spontaneous abortion

Treatment

- Rule out or treat more common aetiologies not specific to EVD. Depending upon the symptoms and working diagnosis, initial treatment with paracetamol, H_2 blockers, or omeprazole may be considered (see dosing above under *Treatment of arthralgia/tenosynovitis and muscle pain*)
- Avoid NSAIDs in patients with gastritis, GERD and PUD
- Consider deworming

Indications for referral to specialist

- Acute abdomen requiring surgical consult (this is a medical emergency)
- Inability to tolerate oral intake
- Persistent abdominal pain despite all attempts at diagnosis and treatment as described above

Neurological

Headache, memory impairment, peripheral neuropathy, and tremor appear to be common after EVD recovery. Less common neurologic sequelae include myopathy, seizures, and Parkinsonism. The causal link of these conditions with EVD remains to be determined. Biological factors as well as stress, depression, and other psychosocial mediators may be implicated. Mental health sequelae are specifically discussed in the section below.

Guidelines for clinical evaluation

- The neurologic examination should include evaluations of frontal release signs (glabellar, palmomental, and snout), eye pursuits, cranial nerves, motor strength and tone, sensory signs (especially of the distal extremities), coordination, and gait.
- It is important to account for possible contributions of psychiatric trauma when performing the evaluation

Differential diagnosis of headache

- Migraine, tension, or cluster headache, idiopathic intracranial hypertension, chronic meningitis, headache related to other infections (sinusitis, influenza, etc), acute meningitis/meningoencephalitis, intracranial tumour, hydrocephalus, subarachnoid haemorrhage, temporal arteritis

Differential diagnosis of peripheral neuropathy

- Nutritional deficiencies (B12 and other B vitamins), infections (HIV, syphilis), endocrine abnormalities (diabetes mellitus, hypothyroidism), exposures (heavy metals), compression neuropathies (carpal tunnel syndrome), autoimmune, paraproteinaemia

Differential diagnosis of tremor

- Parkinson disease, liver dysfunction, metabolic dysfunction (hyperthyroidism), enhanced physiologic tremor, benign essential tremor, alcohol withdrawal, intoxications/exposures (heavy metals such as manganese)

Differential diagnosis of seizures

- Idiopathic seizures, seizure related to metabolic derangement (hypoglycaemia, uraemia, hypocalcaemia, etc), alcohol withdrawal, stroke-related, post-traumatic, infection-related (meningitis, encephalitis), intoxications/medication-related

Treatment of headache – abortive therapy

- For infrequent (less than once a week) or less severe headaches, abortive therapy with paracetamol (first line) or ibuprofen or other NSAID (second line) can be used. See dosing and other considerations above under *Treatment of arthralgia/tenosynovitis and muscle pain*
- These drugs should be used sparingly since analgesic rebound headaches may develop.
- Anti-emetics (promethazine 12.5-25mg orally every 4-6 hours as needed or metoclopramide 10 mg orally every 8 hours as needed) may be used for headache associated with nausea, as well as for more moderate to severe headache, in combination with NSAIDs

Treatment of headache – preventive therapy

- If headaches occur more than once a week, or are very severe, consider preventive therapy. Choices of first line agents include:
  - Propranolol 40mg orally twice daily, increasing to 80mg twice daily after 1-2 weeks if headaches persist and there are no symptoms of hypotension or bradycardia.
    - Monitor heart rate and blood pressure. Avoid if heart rate <60 bpm, or history of asthma or depression.
  - Amitriptyline 10-25mg orally each night, increasing monthly as needed up to 100 mg nightly. This therapy may be helpful in patients with comorbid depression and/or sleep difficulties. Amitriptyline is contraindicated in pregnancy.

Treatment of peripheral neuropathy

- Amitriptyline, as described above

Treatment of tremor

- Postural/action tremor similar to benign essential tremor that interferes with activities of daily living: Propranolol as described above, titrating up to 120-320mg total daily as needed and tolerated.

Treatment of seizures

- First line: Phenytoin 100 mg orally nightly, increasing up to 400 mg daily as needed
- Second line: Carbamazepine 200 mg orally twice a day, increasing as needed by 200mg/day at weekly intervals to a maximum of 1600 mg/day
- Considerations
  - These drugs may cause severe rash, blood dyscrasias, and hepatotoxicity
  - Long term use of phenytoin can lead to osteopenia
  - CBC and LFTs should be monitored after initiation of either drug
  - Both drugs are contraindicated in pregnancy. In females of childbearing potential, consider supplementation with folic acid.
  - If seizures are untreated or refractory to medication, patients should not drive or operate heavy machinery, and should not do certain activities (such as swimming) without supervision.
  - For an acute seizure lasting more than 2 minutes, 10 mg rectal diazepam can be given

Indications for referral to specialist

- Refractory or worsening headaches, headaches with focal deficits, headaches with papilledema on exam
- Headache accompanied by meningeal signs, including fever, neck stiffness, or altered consciousness (this is a medical emergency)
- Refractory neuropathic pain or muscle weakness
- Seizure lasting more than 10 minutes (this is a medical emergency) or episodes of altered consciousness, confusion, jerking or limbs which may be indicative of seizures
- Suspicion of Parkinson's disease

Mental health

Survivors have experienced a life-threatening acute illness in the foreign and fearful environment of an ETU, cared for by people they do not know and whose faces cannot be seen. The experience is particularly daunting for children, who are often alone. Many survivors have witnessed deaths of family members. Furthermore, they are often not able to attend the burial or, due to risk of virus transmission, see the corpse of their loved one. Deaths of parents and caregivers has resulted in a large number of "EVD orphans (24). Upon hospital discharge and return to their community, many survivors experience stigma and isolation, sometimes even from family members. The physical sequelae of EVD may impede resumption of work, with significant psycho-social impacts (11). In the face of such extreme hardship, grief, acute stress, anxiety, depression, sleep disorders, alcohol use disorders, post-traumatic stress disorder, and suicidal behaviour are common (1, 3, 25, 26).

Guidelines for clinical evaluation

- Always check for physical conditions that may underlie or contribute to mental health problems, such as, for example, anaemia for depression
- Ask and look for symptoms and signs of emotional distress (anxiety, mood changes, fatigue), alcohol and drug use, and psychosis (hallucinations, delusions)
- Ask regarding impairment in daily functioning (i.e. is daily functioning impaired to the extent that the person cannot care of themselves or for child/elderly family members?)
- Ask regarding suicidal ideation. If yes, ask for plan and intention
- If and only if treatment for depression is available/accessible, administer the PHQ-9 survey for depression (See Appendix I)

- Ask regarding social support from family and community members
- In some settings, a home visit may provide an opportunity to better assess psychosocial issues, especially in the context of children who have lost their primary caregiver
- For details, see *WHO mhGAP Humanitarian Intervention Guide for Mental, Neurological and Substance use Disorders in Non-specialized Health Settings* (www.who.int/entity/mental_health/publications/mhgap_hig/en/index.html)
- A toolkit to assist social mobilizers and communicators in confronting stigma associated with EVD is available at http://another-option.com/wp-content/uploads/2014/07/AO_EBOLA_Stigma_Toolkit_Final_4.pdf

Differential diagnosis

- Normal reactions to extreme stress (acute stress, grief)
- Depression
- Post-traumatic stress or anxiety disorder
- Psychosis
- Alcohol use disorders
- Drug use disorders

Treatment

- In the context of post-EVD sequelae, a PHQ-9 score of 10 or higher should be considered an indicator of moderate-severe depression requiring treatment
- Treatment options for moderate-severe depression as well as other mental health disorders can be found in the *WHO mhGAP Humanitarian Intervention Guide: Clinical management of mental, neurological and substance use conditions in humanitarian emergencies* (www.who.int/entity/mental_health/publications/mhgap_hig/en/index.html)
- Frequent visits by a community health worker and/or phone check-ins by a mental health worker are advised.
- Group counselling and/or peer support groups may also be useful.

Indications for referral to specialist

- Imminent risk of suicide (current thoughts, plans or acts of suicide; history of thoughts or plans of self-harm in the past month or acts of self-harm in the past year in a person who is now extremely agitated, violent, distressed or uncommunicative)
- Psychotic symptoms, such as hallucinations, delirium, or aggressive behaviour
- Any mental disorder not responding to treatment
- Any child exhibiting symptoms of depression of a mental health disorder should be managed medically by a specialist with experience in children's mental health problems

Sexual health

Erectile dysfunction, testicular pain, dyspareunia, pelvic pain, menorrhagia/metrorrhagia, and amenorrhea are all frequently reported, although the causal link of these conditions with EVD remains to be determined. Erectile dysfunction is a particularly frequent complaint. Biological factors as well as psychosocial mediators may be implicated. Depending upon the presenting complaint, patients should be evaluated for STIs as well as possible underlying causes and contributors, including hypertension, diabetes, tobacco and alcohol use, and mental health complications (depression, PTSD, anxiety). Abdominal, genito-urinary, and pelvic exams should be performed as clinically indicated. Pregnancy testing should be offered to women of reproductive

age with amenorrhea and other menstrual abnormalities. Consider referring patients to a reproductive health specialist and/or for psychosocial support services as needed.

Relapse due to persistent virus and evaluation of new onset fever

EVD survivors readily clear Ebola virus from the blood as the acute symptoms resolve but the virus may persist for months, and in some cases perhaps up to a year or more, in body sites that are harder for the immune system to reach ('immunologically privileged sites'). These sites include the inside of the eye, the central nervous system (brain and spinal cord), testes and the mammary gland. In women who have been infected while pregnant, the virus may persist in the fetus, amniotic fluid, and placenta (27-30). Although arthralgia is very common in EVD survivors, it is unknown whether Ebola virus persists in the joints. There is presently no evidence that women who become pregnant *after* they have recovered from EVD run the risk of persistent Ebola virus infection in the developing pregnancy (fetus, amniotic fluid, or placenta). For women who become pregnant *after* they have recovered from EVD, investigation into potential Ebola virus RNA persistence in breast milk is ongoing (see below).

Although considered rare, relapse due to EVD has been reported. In one case, a survivor developed meningitis nine months after recovery from acute EVD. Ebola virus was detected by RT-PCR in the CSF and at a lower lever in the blood, which was thought to represent "leakage" from the active replication in the central nervous system.

Guidelines for clinical evaluation

- In most cases a RDT for malaria is indicated
- In addition to standard precautions, IPC measures for EVD (see details below) should be implemented for clinicians examining EVD survivors with acute febrile illnesses or other clinical manifestations suspected to reflect potential EVD relapse, as well as when possible exposure is anticipated to blood or any body fluid or tissue of an EVD survivor who is again ill
- Clinicians should consider more common causes of fever in the region, such as malaria and typhoid fever, as well as relapse due to persistent Ebola virus in survivors who present with new onset fever.
- Uveitis and meningitis (if the patient presents with neurological symptoms, including fever, headache, neck stiffness, photophobia, altered mental status, and/or seizures) may be particularly suggestive of EVD relapse.
- In EVD survivors with new onset fever, blood should be tested for Ebola by RT-PCR
- If meningitis is suspected, a lumbar puncture should be performed and the CSF tested for Ebola by RT-PCR. This should be done even if the patient's blood has previously tested negative.
- RT-PCR testing of other body fluids relating to observed focal symptoms, such as joint fluid in patients with inflammatory arthritis or aqueous humour of the eye in patients with uveitis, may occasionally be indicated.

Differential diagnosis

- Malaria
- Typhoid fever
- Rickettsial infection
- Bacterial, TB, or other viral (i.e. non-EVD) meningitis

Treatment

- Malaria treatment if confirmed by RDT or highly suspected
- Antibiotics for suspected typhoid fever or bacterial meningitis

- Anti-TB drugs if confirmed or suspected TB (note that, when possible, the Xpert MTB/RIF rapid test on CSF is preferred over conventional microscopy and culture in persons with suspected TB meningitis: http://www.who.int/tb/publications/xpert_policyupdate/en/)
- Doxycycline for suspected Rickettsial infection

Indications for referral to specialist

- Persons confirmed or highly suspected to have relapsed EVD should be immediately referred to an ETU
- Persons with unprotected direct exposures to potentially infected body fluids and tissues of EVD survivors who have relapsed should be considered potential contacts and monitored for 21 days after exposure.

4. Considerations for special populations

Children (≤ 15 Years Old)

Few data are available regarding EVD sequelae in children, although the physical, psychological, and social impacts of the disease on this vulnerable group are thought to be significant.

Guidelines for clinical evaluation

- Evaluate nutritional status through the measurement of height, weight, head circumference (children < 1 year old), and mid-upper arm circumference (children ≥ 6 months-5 years old) and plot on a UNICEF country-specific growth chart at each clinic visit. Refer to WHO child growth standards for the identification of severe acute malnutrition in infants and children: www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/
- Evaluate neurological development through assessment of neurodevelopment milestones (gross motor, fine motor, speech and hearing, social and behavioural)
- Evaluate social/family situation and general psychological condition: Determine primary care-giver (parents, extended family, foster care, orphanage, vulnerable children), and consider signs of abuse or neglect, food security, child labour, and school attendance
- Perform RDT for malaria if persistent fever or anaemia

Differential diagnosis of suspected malnutrition, faltering growth, or neuro-developmental delay

- Malnutrition (e.g. iron, folic acid, vitamin A and B12, or other vitamin deficiencies)
- Faltering growth (consider testing for other acute and chronic infections such as malaria, TB, HIV/AIDS, gastrointestinal helminthic and parasitic infections, and thyroid abnormalities)
- Neuro-developmental delay due to previous brain injury due to EVD and/or seizure disorder
- Underlying co-morbidity due to malignancy, diabetes mellitus, or immunocompromised state

Treatment

- Malnutrition/Faltering growth: Dietary advice and supplemental feedings according to IMCI guidelines (see the WHO Handbook on Integrated Management of Childhood Diseases: http://apps.who.int/iris/bitstream/10665/42939/1/9241546441.pdf) according to specific deficiency if known, and general treatment guidelines if unknown.
- Check that vaccinations are up to date, including any that the child may have missed during the EVD epidemic. Vaccinations should be given as per routine schedule (www.who.int/immunization/policy/immunization_tables/en/), remembering that children with evidence of immunosuppression or severe acute malnutrition who have active TB or HIV infection should not receive live organism vaccines until their disease is under control.
- Also ensure all children are up to date with any mass drug administration program for eradication of neglected tropical diseases and vitamin A supplementation.

Indications for referral

- Faltering growth: Refer for thorough evaluation of malnutrition, coexisting metabolic or inherited diseases, and chronic infections such as TB and HIV/AIDS, gastrointestinal helminthic and parasitic infections.
- Suspicion of neurodevelopmental delay
- Refer any child with mental health disorder to a child mental health specialist
- Refer to Social Services: Orphans, signs of abuse or neglect, forced labour, or other vulnerability

Pregnant women

Women infected while pregnant

EVD in pregnancy is associated with a high rate of obstetric complications and poor maternal and perinatal outcomes, with neonatal mortality approaching 100%. One newborn survived after receiving experimental therapy. Accumulating evidence demonstrates that pregnant women may occasionally survive EVD without loss of the fetus and may transmit the virus during delivery and/or management of obstetric complications through contact with infectious intrauterine contents (i.e., amniotic fluid, placenta, and fetus).

Pregnant women should receive counselling at ETU discharge with subsequent close clinical follow-up, including antenatal and nutritional care. Arrangements should be made for immediate transfer from home or regular hospital to a setting where full EVD IPC precautions can be taken when labour or obstetric complications occur (see below under *EVD IPC precautions and PPE when handling potentially infectious specimens*). If chorioamnionitis is suspected, proceed with labour induction regardless of gestational age. At all deliveries of women who survived EVD while pregnant, cord blood and swabs of the products of conception (neonate, placenta, and amniotic fluid) should be tested for Ebola virus by RT-PCR. The newborn should also be managed using Ebola IPC precautions for 21 days following birth, regardless of laboratory results or presence or absence of symptoms, since EVD in neonates may be atypical or not evident early in infection.

Women who become pregnant following recovery

There is no evidence that women who become pregnant after they have recovered from EVD are at risk of persistent Ebola virus infection in the developing pregnancy (fetus, amniotic fluid, or placenta). Ebola virus RNA has been detected at low levels in breast milk up to 16 months after onset of symptoms; further characterization of these findings is ongoing. Pregnancy, childbirth and postnatal care should be provided according to WHO and national recommendations and standard obstetric IPC precautions should be followed (see www.who.int/maternal_child_adolescent/documents/preconception_care_policy_brief.pdf?ua=1) with the exception of guidance concerning breastfeeding in lactating EVD survivors (see below under *Breast milk testing, breastfeeding, and counselling for female EVD survivors).*

As described above under *Relapse due to persistent virus and evaluation of new onset fever*, risks and benefits of epidural and spinal analgesia/anaesthesia should include consideration of potential viral persistence in the cerebrospinal fluid.

Numerous anecdotal reports exist of stillbirths in women who have conceived after recovering from EVD but it is still uncertain whether the rate of stillbirth in EVD survivors is higher than that of the general population. Until more evidence is available, pregnancy in EVD survivors should be considered at-risk for fetal complications and providers should consider performing intermittent assessments of fetal wellbeing via exam or ultrasound when available.

More information on EVD in pregnancy is available at: www.who.int/csr/resources/publications/ebola/pregnancy-guidance/en/.

5. Monitoring for persistent Ebola virus infection in survivors: guidelines for testing and counselling

Semen testing and counselling for male EVD survivors

Recent data suggest that Ebola virus can persist in the semen of males for a year or more after acute infection, although it is not clear for how long the virus is still infectious (31). Although thought to be rare, sexual transmission of Ebola virus has been reported (15, 32). Consequently, all EVD survivors and their sexual partners should receive counselling to ensure safe sex practices until their semen has been determined to be free of Ebola virus.

The semen of EVD survivors should be assumed to contain Ebola virus for the first 3 months after disease onset. RT-PCR testing of the semen should then be performed at 3 months and every month thereafter until their semen tests negative for virus twice, with an interval of at least one week between tests. Pre- and post-test counselling should be performed by experts in sexual transmission counselling.

Until a male EVD survivor's semen can be determined to be Ebola virus free through the testing described above, survivors and their sexual partners should either (a) abstain from all types of sex or (b) observe safe sex through correct and consistent condom use.[2] Survivors should be provided with condoms and instructions for safe disposal to prevent contact with seminal fluids (see below under *Infection prevention and control considerations in EVD survivors*). Survivors should also practice good hand and personal hygiene by immediately and thoroughly washing with soap and water after any physical contact with semen, including after masturbation.

Having tested twice negative, survivors can safely resume normal sexual practices, although condom use is still recommended for protection against STIs such as HIV and unwanted pregnancy. If an Ebola survivor's semen has not been tested, he should continue to practice safe sex for at least 12 months after the onset of symptoms; this interval may be adjusted as additional information becomes available on the duration of Ebola virus in the semen of survivors.

More information on sexual transmission of Ebola virus is available at: http://www.who.int/reproductivehealth/topics/rtis/ebola-virus-semen/en/.

Vaginal fluids testing and counselling for female EVD survivors

Ebola virus RNA has been detected by RT-PCR in vaginal fluid from one woman 33 days after symptom onset. However, live virus has never been isolated from vaginal fluids and no suspected cases of female-to-male sexual transmission have been reported. Therefore, routine testing of vaginal fluids is currently not recommended. Additional information and guidance may be available after more research is performed.

Breast milk testing, breastfeeding, and counselling for female EVD survivors

Ebola virus RNA has been detected at low levels in breast milk up to 16 months after onset of symptoms. More evidence is needed to know the precise duration and infectivity of Ebola virus persistence in breast milk.

Due to risk of virus persistence in breast milk, EVD survivors who are lactating may wish to have their breast milk tested for Ebola virus by RT-PCR. Women who do not know the status of their breast milk or who were tested and for whom no Ebola virus RNA was detected should continue breastfeeding. If Ebola virus RNA is detected, breastfeeding should be suspended and the breast milk retested every 48 hours until two consecutive "undetected" results are obtained. During this time, breast milk should be replaced with a sustainable appropriate breast-milk substitute. Where possible, provide liquid ready-to-use infant formula

[2] Although condom use is thought to be protective, no data exist on their efficacy in preventing sexual transmission of Ebola virus.

(see http://www.ennonline.net/operationalguidanceiycfv2.1), which is a less risky option than powdered infant formula since it does not require reconstitution with water. Hygiene of feeding utensils, adequate supplies for as long as the infant needs them, and access to health services are essential. When providing infant formula (liquid or powdered), counsel the mother on minimising the risks of formula feeding (for practical considerations on replacement feeding see *Infant feeding in the context of Ebola at* http://www.ennonline.net/infantfeedinginthecontextofebola2014). Meanwhile, mothers should be supported to keep up their breast milk production and enable them to resume breastfeeding once two consecutive milk samples test negative. Other psychosocial support should be provided to the mother and family as needed. In order to resume breastfeeding, she should be taught and supported to express breast milk regularly either manually or with a breast pump, following EVD IPC guidelines to reduce risk of virus transmission (see below under *Infection prevention and control considerations in EVD survivors*). Babies who have been breastfed by a mother whose milk tests positive should be monitored as a close contact for 21 days since the last day of breastfeeding of the RT-PCR positive milk.

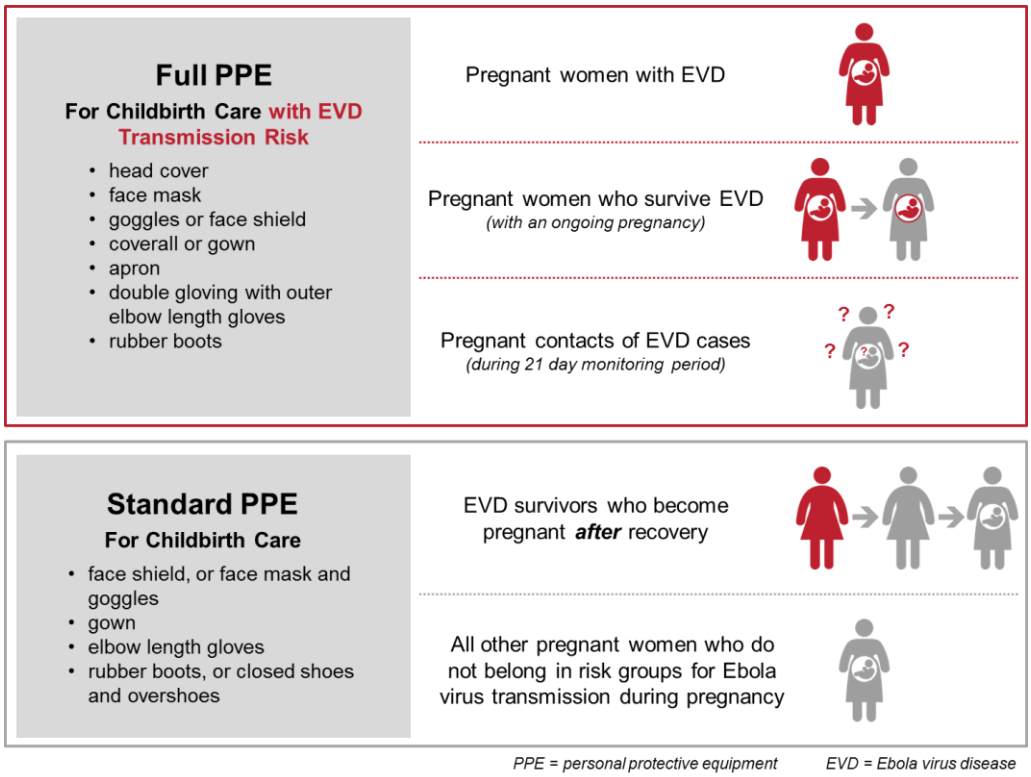
6. Infection prevention and control considerations in EVD survivors

Standard IPC precautions for routine clinic visits

Standard IPC precautions (http://www.who.int/csr/resources/publications/standardprecautions/en/) should be maintained at all routine (i.e. the survivor does not complain of acute febrile disease or other manifestations suggesting potential relapse) clinic visits, with appropriate use of PPE and application of the *My Five moments for hand hygiene* approach (http://www.who.int/gpsc/5may/hh_guide.pdf).

EVD IPC precautions and PPE when handling potentially infectious specimens

Health workers collecting or handling potential Ebola virus-infected specimens from EVD survivors, including semen specimens and specimens collected from patients with possible relapse, should always wear full EVD PPE. This includes, but is not limited to, while attending to deliveries of women who were infected with Ebola virus while pregnant (see Figure below); performing surgical procedures that involve the eye, male genito-urinary tract, brain and spinal cord, or female breast; and aliquotting specimens or performing centrifugation. PPE should include head cover, face mask, goggles or face shield, boots, coverall or gown, apron, and double gloves (with outer gloves being elbow length for deliveries). Special attention should be given to appropriate waste, sharps and linen management, as well as strict adherence to environmental cleaning and decontamination protocols of reusable medical equipment. For additional guidance on the types of EVD PPE to be used and instructions for putting on and removing and waste management and environmental cleaning guidance, please refer to WHO's *Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with focus on Ebola* (http://apps.who.int/iris/bitstream/10665/130596/1/WHO_HIS_SDS_2014.4_eng.pdf?ua=1) and *How to put on and how to Remove Personal Protective Equipment – Posters* (http://who.int/csr/resources/publications/ebola/ppe-steps/en/#).



Disposing of infectious waste

All waste potentially infected with Ebola virus should be collected in designated containers and leak proof bags (two if necessary) and stored in a safe place away from children and animals until it can be collected and incinerated, preferably on site, according to waste management recommendations for EVD care. If waste is moved offsite, it is critical to understand where and how it will be treated and destroyed. If incineration is not possible, then burning and/or burying, followed by covering with soil, is recommended. For more information refer to WHO's guideline on *Safe Management of Wastes from Health-Care Activities* (http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1).

IPC guidance for survivors at home

Breast milk from lactating EVD survivors and semen from male EVD survivors are two body fluids in which Ebola virus may persist for many months. Women and men whose breast milk or semen are RT-PCR positive or have not been tested should practice good hand and personal hygiene by immediately and thoroughly washing with soap and water after any contact with these body fluids. Any other potentially contaminated objects or surfaces should be washed with water and soap and then decontaminated by soaking them in a 0.5% chlorine solution for 15 minutes. Contaminated bed sheets or clothing should be safely disposed of and incinerated. All potentially contaminated materials should be collected in designated containers and safely disposed of as described in the section on *Disposing of infectious* waste above. If this is not possible, these materials should first be laundered with detergent and water, then rinsed and soaked in 0.05% chlorine solution for 15 minutes. Survivors should be informed that this handling may damage the materials. Used condoms should be burned in a burn pit, disposed of in pit latrines or buried.

Elective surgery and management of penetrating traumatic injury

Although more evidence is needed, the available data indicate that Ebola virus may persist for a year or more in certain body sites (including the eye; male genito-urinary tract; brain and spinal cord; mammary gland; and fetus, amniotic fluid, and placenta of women infected during pregnancy; and potentially the joints). Elective surgery on any of these body sites in EVD survivors should thus be performed only after careful consideration of the risk-benefit to the patient and the surgical team and supporting health workers. In most cases, it is advisable to delay elective surgery until at least one year after resolution of acute EVD. In cases where it is deemed essential to proceed with surgery involving a body site where Ebola virus is known to persist, the procedure should be done under full EVD IPC precautions. In addition, in order to appropriately assess and manage risk post-operatively, swabs of the implicated body site or fluid should be taken and tested for Ebola by RT-PCR. The same approach should be taken when attending to penetrating trauma to these body sites in EVD survivors.

7. Risk communication considerations

How risk communication affects clinical care

Risk communication is the exchange of information and concerns between the expert (the health care team) and the persons at risk (the Ebola survivor). It is a dynamic process and must be part of the clinical care provided to survivors

One of the key challenges of risk communication is that experts and those affected do not necessarily assess risk in the same way. Many subjective factors (e.g. familiarity of a hazard, magnitude of a hazard, previous experience, traditional beliefs, fear and controllability) lead to risk perception. This makes the work of clinical teams challenging as survivors will not always follow expert advice.

The second challenge in risk communication is that trust must be present in order for people to take expert advice. Trust can be eroded if those delivering health care are not credible, are not perceived to have expertise, do not show empathy or do not keep their promises. Therefore all risk communication must aim to strengthen trust in the clinical care teams and services.

Effective risk communication improves utilization of health services, increases compliance with treatment and care, and builds trust and confidence in health professionals. Ultimately, it contributes to good outcomes in survivors and can help prevent further transmission. Risk communication is an integral part of clinical care.

Risk communication considerations

Ebola survivors and their families have all inevitably undergone great suffering and challenges. They have survived, but have many fears, concerns and questions. Their understanding of Ebola and what it means to be a survivor are influenced by their previous experiences and their social and cultural contexts. Therefore it is important that health care providers, health facility personnel, those providing community and family level care, and health policy and planning officers use good risk communication practice.

When people are consumed by their worries they cannot listen to or take the advice we give, however reasonable. It is important to listen and acknowledge people's fears, concerns or anger before providing advice. In risk communication, misperceptions, misinformation and rumours arise and they must be identified and addressed quickly and with empathy.

Good practice

Tips for effective risk communication in the clinical management of survivors include:

1. Try to understand how the Ebola survivor and their family perceive their health status and identify their main concerns – stigma, inability to find employment, worries about transmitting the disease through sexual contact or from mother to baby.
2. Elicit these concerns as part of a conversation, before giving advice or instructions. Provide opportunities – prompted or spontaneous – for them to ask questions.
3. Use language that is appropriate for the educational level of the survivor. Explain scientific terms and avoid using jargon. Use the language of the survivor and their community.
4. Use pictures and posters to reinforce what you say and to provide another way to convey your messages and advice.
5. Work with community level health workers, volunteers and other groups and adapt your advice as needed (e.g. content, language, modes of delivery).
6. Engage community leaders, religious figures and other trusted persons to help you get your messages across and to reinforce the advice given by clinical care personnel.
7. Find ways to get feedback on how survivors and their families perceive your communications and make regular improvements to the way you communicate risk.

8. Work closely with risk communications experts to deal with challenges such as “resistance” and rumours and if possible, enlist them to train clinical teams on risk communication.

There are often critical points in the interactions between the Ebola survivor, their family and health care personnel at which effective risk communication is very important.

- **Pre-clinical stage:** Good risk communication encourages and motivates survivors to seek clinical care and support.
- **First visit to a care facility or service:** Good risk communication by all personnel (e.g. doctors, nurses, receptionists, gatekeepers, cleaners) influences the perception that the survivor will develop about receiving health care and following the advice and treatment given.
- **Subsequent visits or interactions:** Good risk communication during subsequent visits can strengthen the trust and confidence the survivor develops about the services provided, and allows for opportunities for the clinical care team to address persisting and new concerns. If the experience is positive, the survivor may become a champion and encourage others to seek care.

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Appendix I. Patient health questionnaire for depression (PHQ-9)

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.

Appendix II. Essential medications, diagnostic tests, and equipment list for the care of EVD survivors

Medications

- Analgesics/anti-inflammatories
  - Paracetamol
  - Ibuprofen
  - Prednisone (oral and IV)
  - Methotrexate
- Antacids
  - Ranitidine
  - Omeprazole
- Antibiotics
  - Amoxicillin
- Antihelmenthics/antiparasitics
  - Ivermectin
- Antimalarial drug as per the current national treatment policy
- Antidepressants/anxiolytics/antipsychotics
  - Fluoxetine
  - Diazepam
  - Haloperidol
  - Amitriptyline
- Eye care
  - Prednisolone acetate drops 1%
  - Atropine drops 1%
  - Cyclopentolate 1%
  - Timolol drops 0.5%
  - Tetracycline ointment
  - Artificial tears

Diagnostic assays

- Molecular-based assays for Ebola virus RNA (i.e. RT-PCR)
- Malaria rapid tests
- Urine pregnancy tests
- HIV tests

Equipment

- Slit lamps
- Tonometers to measure intraocular pressure
- Ophthalmoscopes
- Audiometers
- Tuning forks
- UNICEF country specific growth charts
- Mean upper arm circumference tapes