# INFECTION CONTROL MANAGEMENT OF VIRAL HAEMORRHAGIC FEVERS POLICY

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<th>5</th>
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<th>June 2016</th>
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<td>Policy Owner</td>
<td>Director of Infection Prevention and Control</td>
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<tr>
<td>Author</td>
<td>Nurse Consultant Infection Prevention and Control</td>
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<td>Infection Prevention &amp; Control Committee</td>
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1. **RATIONALE**

1.1 Viral Haemorrhagic Fever (VHF) is a term used to describe a severe, multi-organ disease in which the overall vascular system is damaged and the body’s ability to regulate itself is impaired. Disease is often accompanied by varying degrees of haemorrhage which can add greatly to the difficulties of patient management and be life-threatening for the patient.

1.2 VHF's are severe and life threatening diseases that have been reported in areas of Africa, Asia, South America, the Middle East and Eastern Europe. Environmental conditions in the UK do not support the natural reservoirs or vectors of the diseases. All recorded cases of VHF in the UK have been acquired abroad, with one exception of a laboratory worker who sustained a needle-stick injury. There have been no cases of person-to-person transmission of VHF in the UK to date of publication of this policy.

1.3 VHF should be considered in febrile patients who have recently returned (up to 21 days) from an endemic area, although in most cases VHF can be dismissed on epidemiological grounds.

1.4 Symptoms of VHF usually include fever, headache, and myalgia. Diarrhoea, vomiting and haemorrhage can occur in the later stages of illness. VHF’s are difficult to recognize and detect rapidly and there is no effective treatment.

1.5 Person to person transmission of VHF can occur through direct contact (through broken skin or mucous membrane) with blood or body fluids, and indirect contact with environments contaminated with splashes or droplets of blood or body fluids. Experts agree that there is no circumstantial or epidemiological evidence of an aerosol transmission risk from VHF patients.

1.6 Communication with staff about potential infection risks is paramount. Staff must be informed of the infection control precautions required when caring for the patient.

1.7 These guidelines aim to assist staff in the risk assessment of a potential case of VHF and to guide the infection control management required to reduce the risk of transmission within the hospital.

1.8 These guidelines only cover those VHF’s that are classified as Hazard Group 4 pathogens (Appendix J).

2. **VIRAL HAEMORRHAGIC FEVERS/KNOWN ENDEMIC AREAS**

2.1 In Africa, the high risk areas for Viral Haemorrhagic Fevers (VHF) are those countries indicated on this map. CCHF virus is endemic in many countries in Africa, the Middle East, Eastern Europe and Asia. Infections seen outside Africa are noted below.

2.2 Other possible causes of viral haemorrhagic fever include:

- South American arenaviruses found in Argentina, Bolivia, Brazil and Venezuela (Infection in travellers is very rare)
- Kyasanur Forest Disease - India (Karnataka State only)
- Alkhurma Haemorrhagic Fever - Saudi Arabia
- Omsk Haemorrhagic Fever - Russian Federation (Siberia)

2.3 Map of VHF Regions:

2.4 Further details on specific countries, viruses or risk areas can be found at the following links:

Lassa Fever
Ebola/Marburg
CCHF (Crimean-Congo haemorrhagic fever)

3. **AIM**

3.1 The aims of these guidelines are to highlight:

- The immediate actions to be taken once the possibility of VHF has been raised
- The infection control precautions that MUST be taken by all healthcare staff to prevent the person to person spread of a VHF

3.2 The contents of these guidelines are summarised in a flow chart, Annex A.
4. DEFINITION OF TERMS

4.1 **Aerosol generating procedure (AGP)** – a procedure that stimulates coughing and promotes the generation of aerosols.

4.2 Examples given include:

- Endotracheal intubation
- Bronchoscopy
- Airway succioning
- Positive pressure ventilation via face mask
- High frequency oscillatory ventilation
- Diagnostic sputum induction
- Central line insertion

4.3 **Ambulance Category 4 Infectious Disease**
Diseases that require a special (Category 4) infection control measure for ambulance transfer. Currently, these diseases include plague, rabies, Lassa fever, Marburg, Ebola, and Crimean- Congo haemorrhagic fever.

4.4 **Category A Infection**
Infections that pose the highest risk to public health and have a high mortality rate e.g. viral haemorrhagic fever (VHF), smallpox, anthrax, plague, botulism and tularemia.

4.5 **Category A Waste**
Waste that is known or suspected to be contaminated with pathogens presenting the most severe risk.

4.6 **Category B Waste**
Clinical waste that is known or suspected to be contaminated with pathogens not listed for inclusion into category A waste.

4.7 **Fever**
Temperature > 37.5°C

4.8 **HLIU**
High Level Isolation Unit

4.9 **Notifiable Disease**
Disease notifiable (to Local Authority Proper Officers) under the Health Protection (Notification) Regulations 2010 by Lead Clinician (see section 3).

4.10 **Patient Contact**
A person who has been exposed to an infected person or their blood and body fluids, excretions or tissues following the onset of their fever.
4.11 **Unlikely to have VHF infection**
The patient does not have a fever $>38^\circ C$, currently or within the last 24 hours, has not returned from a VHF endemic country within the last 21 days, and has not had contact with body fluids or clinical specimens from an individual or laboratory animal known or strongly suspected of having VHF.

4.12 **Low Possibility of VHF**
Fever of $>37.5^\circ C$, currently or within the last 24 hours, has returned from a VHF endemic or outbreak area within the last 21 days, but has no extensive bruising or active bleeding.

4.13 **High Possibility of VHF**
Fever of $>37.5^\circ C$, currently or within the last 24 hours, has returned from a VHF endemic or outbreak area within the last 21 days and has either had contact with body fluids or clinical specimens from an individual or laboratory animal known or strongly suspected of having VHF, or meets the criteria in the most current version of the DOH Risk Assessment Tool.

4.14 **Confirmed VHF**
Patient has a positive VHF screen.

5. **ROLES AND RESPONSIBILITIES**

5.1 **The Assessing/Treating Clinician** of any patient presenting to the hospital, who is suspected to be suffering from VHF:

- Should be the Lead Clinician. This is a senior member of the medical team who is responsible for the acute care of the patient, for example the emergency care physician, emergency department consultant or admitting team consultant. Out of hours, they should be at least Registrar grade.

- Must ensure that a risk assessment is completed immediately, using Annex A VHF Risk Assessment.

- Must discuss and formally notify the Consultant Medical Microbiologist (CMM). The CMM must be kept up-to-date with any change in risk assessment. (See Appendix D for contact details).

- Inform the Essential Services Laboratory in hours or the Laboratory Duty manager out of hours prior to requesting laboratory tests (see Appendix D for contact details).

- Must formally notify the Consultant for Disease Control (CCDC) of a patient with a ‘high possibility’ of, or ‘confirmed’ VHF (see Appendix D for contact details). A patient categorised as ‘possibility of VHF’ or below does not need to be notified.

- If laboratory test results refute the clinical diagnosis later, the Lead Clinician is not required to de-notify the case.

- Is responsible for requesting investigations (Appendix C) in order to prevent unnecessary tests being sent to the laboratory.
• Is responsible for discussing the patient with the nearest HSIDU if the patient deteriorates and needs transfer (Annex A VHF Risk Assessment).

• The Reference Laboratory (Porton Down or Colindale): Will notify Public Health England (PHE) if VHF is confirmed on laboratory investigations, even if the case has already been notified by the Lead Clinician. (See Appendix D for contact details).

5.2 The Consultant for Disease Control (CCDC)

Once informed of a case of ‘high possibility of’ or “confirmed” VHF the CCDC will:

• Convene an incident/outbreak control group
• Ensure that all the necessary control measures are implemented correctly
• Ensure that all close contacts are identified and surveillance undertaken as necessary.

5.3 The Consultant Medical Microbiologist

The Consultant Medical Microbiologist, in cases of a “low possibility of VHF” or ‘high possibility of VHF’ when the malarial screen is negative and VHF is still clinically suspected, must:

• Contact and discuss the case with the Imported Fever Service which is on call 24 hours. An alternative number is the switchboard at Porton Down (also 24 hours) (See Appendix D for contact details).

• Liaise with the medical teams regarding the management of patients who have, or who are suspected of having VHF.

In cases of “low possibility”, “high possibility” or “confirmed” VHF the CMM must:

• Inform the Essential Services Laboratory in hours or the Laboratory Duty manager in and out of hours regarding initial risk assessment and provide further updates to risk assessment .(See Appendix D for contact details).

• In cases of “high possibility” of VHF where the malarial screen is negative and VHF is suspected clinically, or in “confirmed” VHF, the CMM will liaise with the CCDC.

• Provide out of hours Infection Control advice.

5.4 The Infection Control Doctor

• Will be responsible for local infection control risk assessment and procedures of a patient with “confirmed” VHF if they cannot be transferred to the HLIU. Discussions with the Health and Safety Executive and experts at the HLIU are also necessary.
5.5 The Infection Prevention and Control Team

- The Infection, Prevention and Control Team are responsible for:
  - Provide specialist advice on the Infection Control precautions necessary as detailed in these guidelines.
  - Liaise with the Clinical Site Managers to ensure that the patient is not transferred out of the ward/department to which they present, unless the patient presents to ED.
  - To liaise with the Clinical Site Managers to identify a negative pressure room to transfer any patient who presents to ED with a possibility, high possibility or confirmed VHF.
  - Liaise with the nurse in charge of the ward to ensure that patients or staff who have had close contact (as defined in section 11) with a person with suspected VHF are identified and appropriate action taken.

5.6 The Clinical Site Management Team

The Clinical Site Managers are responsible for:

- Ensuring that a single room is made available in the ward or department to which the patient presented; and
- Ensuring that the patient is not transferred out of the ward/department to which they present until advised by the Infection Prevention and Control Team or Medical Microbiologist. If transfer from ED is required, to make available the negative pressure isolation room (situated on ICU).

5.7 The Nurse in Charge of the Ward/Department must

- When a patient is suspected of having VHF, ensure that all staff are aware of and carry out the Infection Control precautions detailed in these guidelines.
- Inform the IPCT immediately.
- Provide a list of patients who have had close contact with the patient suspected of VHF (section 11) and inform the Infection Prevention and Control Team.
- Maintain a list of all staff who have had contact with the patient (section 11) and inform Occupational Health.

5.8 Occupational Health is responsible for:

- Liaising with the nurse in charge of the ward to ensure that staff who have had close contact (as defined in section 11) with a person with suspected VHF are identified.
• Advising staff exposed to VHF about following health monitoring (see Appendix H Management of staff accidentally exposed to potentially infectious material).

• Liaising with the CCDC for the management of exposed staff.

5.9 **Housekeeping are responsible for:**

• The timely removal and safe transport and disposal of Category A waste.

• Providing disposable cutlery, crockery and bed linen for use in the isolation room.

5.10 **All Staff**

• All staff are responsible for ensuring that infection control precautions are followed when a patient is suspected, or confirmed, as having a VHF.

6. **MODE OF TRANSMISSION**

6.1 Within the hospital environment VHF can spread via direct contact with broken skin or mucous membranes, blood, body fluids, secretions and excretions of an infected individual or indirect contact with environments contaminated with splashes or droplets of blood or body fluids. VHF viruses have been known to survive for anywhere between 2 weeks and 2 months on contaminated fabrics and equipment.

6.2 The virus may be present:

• in blood

• in bodily fluids, including urine

• on contaminated instruments and equipment

• in waste

• on contaminated clothing

• on contaminated surfaces

6.3 Exposure can occur:

• Directly, through exposure (via broken skin or mucous membranes) to blood and/or body fluids during invasive, aerosolising or splash procedures.

• indirectly, through exposure (via broken skin or mucous membranes) to environments, surfaces, equipment of clothing contaminated with splashes or droplets of blood or body fluids.

N.B. Healthcare and laboratory staff are at risk of contamination via
accidental inoculation with contaminated needles.

7. ASSESSMENT

7.1 The patient risk assessment should be led by a senior member of the medical team responsible for the acute care of patients, for example the emergency care physician, emergency department consultant or admitting team consultant. For the purposes of this document they will be referred to as the “Lead Clinician”. The consultant microbiologist may also need to be involved. A risk category must be assigned by the senior member of the medical team to any patient who has a fever, or history of fever in the previous 24 hours, and a travel history to an area which is endemic for VHF within 21 days following the risk assessment algorithm. (Annex A VHF Risk Assessment). This will determine the subsequent management of the patient and the level of staff protection required.

7.2 Standard infection control precautions should already be in place. If these measures are not already in place, they must be introduced immediately when dealing with a patient in whom VHF is being considered. A patient’s risk category can change depending on symptoms and/or results of diagnostic tests, and it is important to note that a patient with a VHF infection can deteriorate rapidly. Use the risk assessment algorithm in Annex A VHF Risk Assessment.

7.3 Following risk assessment the patient should be assigned to one of the following 4 categories:

- Unlikely to have a VHF
- Low Possibility of VHF
- High possibility of VHF
- Confirmed VHF

8. PATIENT PLACEMENT

8.1 Refer to Annex B – Admission Flowchart

9. MANAGEMENT

9.1 See Annex A VHF Risk Assessment.

9.2 See Appendix A for infection control precautions.

9.3 Management of a patient categorised as ‘unlikely to have a VHF’

A patient with a fever of > 37.5°C is unlikely to have VHF if;

- they have not visited a VHF endemic area within 21 days of becoming ill
• they have become unwell more than 21 days after caring for or coming into contact with the bodily fluids of handling clinical specimens from a live or dead individual or animal known or strongly suspected to have a VHF

• their UK malaria screen is negative and subsequently their fever resolves for >24 hours

• their UK malaria screen is positive and they respond appropriately to malaria treatment

• If they have a confirmed alternative diagnosis and are responding appropriately.

However, the patient’s condition should be reassessed if, in the absence of any other diagnosis, any of the following develop

• Nose bleed

• Bloody diarrhoea

• Sudden rise in aspartate transaminase (AST)

• Sudden fall in platelets

• Clinical shock

• Rapidly increasing O2 requirements in the absence of other diagnosis

• Infection control; standard infection control precautions apply for patients in this category (Appendix A). Laboratory specimens can be sent in the normal way (Appendix C).

9.4 Management of a patient categorized as ‘low possibility of VHF’

• A senior member of the medical team responsible for the acute care of the patient should be the Lead Clinician.

• It is recommended that, if a patient is bruised or bleeding, the Lead Clinician should have an urgent discussion with the nearest High Security Infectious Disease Unit (HSIDU) in the Royal Free Hospital, London (See Appendix D for contact details).

• Inform all staff caring for the patient and reinforce the need to take the appropriate infection control precautions (see Appendix A).

• Send urgent malaria screen and discuss with consultant microbiologist.

• If malaria screen negative and has continuing fever, relevant travel history and no alternative diagnosis send VHF screen and consult
with HSIDU in Newcastle or the Royal Free Hospital, London. (See Appendix D for contact details).

- Other investigations may include full blood count (FBC), urea and electrolytes (U&E’s), liver function tests (LFTs), glucose, C-reactive proteins (CRP), clotting screen blood cultures urine and stool. Chest X-ray (CXR) may also be considered. However, the CMM must be informed, particularly if the patient has bruising or bleeding. (See Appendix C)

- Laboratory staff must be notified by the Lead Clinician (see Appendices C and D) prior to sending the samples. Samples should be treated according to the regulations in Appendix C. Designated containers for VHF (found in ED, ICU and EAU) should be taken in person or by porter. Do not send any specimens via the pneumatic air tube system.

- A list of all staff contacts should be given to the Occupational Health in all cases of "possibility of VHF" with bruising or bleeding (Appendix H) by the Nurse in Charge of the Ward/Department.

- Healthcare waste generated as a result of specimen collection must be treated as Category B infectious waste.

9.5 Management of a patient categorized as ‘high possibility of VHF’

- A senior member of the medical team responsible for the acute care of the patient should be the Lead Clinician.

- See Appendix J for information and web links to the VHF viruses on the Public Health England website.

- It is recommended that, if a patient is bruised or bleeding, or has uncontrolled diarrhoea or vomiting, the Lead Clinician should have an urgent discussion with the HLIU (the Royal Free Hospital, London) concerning patient management and consider early transfer to the HLIU. See Appendix D for contact details and Appendix B for transfer information.

- Send urgent malaria and VHF screen. Other investigations may include full blood count (FBC), urea and electrolytes (U&E’s), liver function tests (LFTs), glucose, C-reactive proteins (CRP), clotting screen blood. Analysis should not be delayed while waiting for results of VHF screen.

- Specimens should be discussed in advance between clinicians and the appropriate specialist for each laboratory area before they are sent.

- Laboratory staff must be notified by the Lead Clinician (see Appendices C and D) prior to sending the samples. Samples should be treated according to the regulations in Appendix C. Designated containers for VHF (found in ED, EAU and ICU) should be taken in person or by porter. Do not send any specimens via the pneumatic air tube system.
• The case must be notified immediately by the Lead Clinician to the CCDC, who will effect forward notification of Public Health England (PHE) (Appendix D).

• Inform all staff caring for the patient and reinforce the need to observe enhanced infection control precautions appropriate to patient’s symptoms (see Appendix A).

• Restrict, and maintain a record of the names of, staff attending to the patient. Healthcare worker contacts should be identified (see section 11) and referred to Occupational Health.

• Provide a list of patient contacts and inform the Infection and Prevention Control Team.

• Healthcare waste generated as a result of specimen collection must be treated as Category A infectious waste.

• If the VHF screen is positive, a number of urgent actions are required – (see Section 9.6).

• If the VHF screen is negative, a VHF infection in the patient should still be considered as a possibility until either the patient has been afebrile for over 24 hours or an alternative diagnosis is confirmed. The patient should therefore remain isolated in a single side room and the infection control measures continued until VHF infection is no longer being considered.

9.6 Management of a patient with ‘confirmed VHF’

• See Appendix J for information and web links to the VHF viruses on the Public Health England Website.

• The Lead Clinician should urgently discuss with the nearest HLIU to arrange for the immediate transfer of the patient to the HLIU. See Appendix E for contact details and Appendix B for transfer information.

• Inform those in contact with the patient of the positive test and emphasise the infection control precautions required.

• Any further specimens must be discussed in advance between clinicians and the appropriate specialist for each laboratory area before they are sent.

• Laboratory staff must be notified by the Lead Clinician (see Appendices C and D) prior to sending the samples. Samples should be treated according to the regulations in Appendix C. Designated containers for VHF (found in ED, EAU and ICU) should be taken in person or by porter. Do not send any specimens via the pneumatic air tube system.
• The case must be notified immediately by the Lead Clinician to the
CCDC, who will effect forward notification of Public Health England
(PHE) (Appendix D).

• Restrict, and maintain a record of the names of, staff attending to
the patient. Contacts should be identified (see section 9) and
referred to Occupational Health.

• Provide a list of patient contacts and inform the Infection Prevention
and Control Team.

• Healthcare waste generated as a result of specimen collection must
be treated as Category A infectious waste.

9.7 Antivirals

• Antivirals, specifically ribavirin, have been shown to be effective in
the treatment of early-stage arenavirus infections, particularly Lassa
fever. There is however evidence to suggest that ribavirin may
prolong the incubation period for Lassa fever. **Antivirals are not
generally recommended for contacts due to the absence of
evidence of their proven effectiveness for prophylaxis.** However,
antivirals may be considered for those direct contacts at highest risk,
subject to individual risk assessment. Liaison with the local
Microbiologist/Virologist is advised if antivirals are being considered.

10. **NOTIFICATION**

10.1 In England, VHF is a notifiable disease under Schedule 1 of the Health
Protection (Notifications) Regulations 2010, and notification of VHFs is
classified as urgent. The Lead Clinician must therefore notify the ‘highly
possible’ or ‘confirmed’ case of VHF by telephone to the CCDC immediately
(see Appendix D for contact details).

11. **CONTACTS**

11.2 **Definition:** A contact is defined as a person who has been exposed to an
infected person or their blood and body fluids, excretions or tissues following
the onset of their fever.

11.3 **Patient Contacts:** Each potential contact should be individually assessed for
risk of exposure and categorised according to categories listed in Appendix G.

11.4 **Healthcare worker contacts:** A list of all staff contacts should be given by
the Nurse in Charge of the Ward/Department to the Occupational Health in all
cases of “possibility of VHF” with bruising or bleeding, “high possibility of VHF”
or “confirmed VHF” (see Appendix H).

12. **APPLICABILITY**

12.1 These guidelines apply to staff employed by the Trust. Patients, visitors
and the general public will be made aware of these guidelines as
required.

13. IMPLEMENTATION, MONITORING AND EVALUATION

13.1 Responsibility for implementation, monitoring and evaluation is identified in the Trust’s Policy on Procedural Documents. This guideline will be monitored via a robust review following identification and management of each individual case.

14. REFERENCES

14.1 Department of Health (2014), Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence, Advisory Committee on Dangerous Pathogens.

14.2 World Health Organisation website: www.who.int

14.3 Trust Policy: Waste Management with Summary Policy and Procedure

14.4 Useful website: Centres for Disease Control and Prevention, information on VHF at: http://www.cdc.gov/vhf/virus-families/index.html

14.5 United Nations Economic Commission for Europe; European Agreement concerning the International Carriage of Dangerous Goods by Road

15. ANNEXES & APPENDICES

15.1 Annex A – VHF Risk Assessment

15.2 Annex B – Admission Flowchart

15.3 Appendix A - Summary of Infection Control Precautions for Patient with ‘Low Possibility Of VHF’, A ‘High Possibility Of VHF’, Or ‘Confirmed VHF’

15.4 Appendix B - Transfer of a Patient with High Possibility or Confirmed VHF Within The UK

15.5 Appendix C - Safe Collection and Transport of Specimens

15.6 Appendix D - Useful Numbers and Contacts

15.7 Appendix E - Management of Waste

15.8 Appendix F - Spillages of Blood or Body Fluids

15.9 Appendix G - Categorisation and Management Of Contacts

15.10 Appendix H - Management of Staff Accidentally Exposed to Potentially Infectious Material

15.11 Appendix I - Care After Death

15.12 Appendix J - Hazard Group 4 Viruses
16. **ANNEX A – EQUALITY IMPACT ASSESSMENT TOOL**

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

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<td>2. Is there any evidence that some groups are affected differently?</td>
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If you have identified a potential discriminatory impact of this procedural document, please refer it to the Trust’s lead for Equality & Diversity, together with any suggestions as to the action required to avoid / reduce this impact.

For advice in respect of answering the above questions, please contact the Trust’s lead for Equality & Diversity.

**Signed –**

**Date –**
15.1 VIRAL HAEMORRHAGIC FEVERS RISK ASSESSMENT (Version 5: 06.11.2014)

VHF ENDEMIC COUNTRIES:

ADDITIONAL QUESTIONS:
- Has the patient travelled to any area where there is a current VHF outbreak? (http://www.who.int/csr/disease/crenue/index.html) OR
- Has the patient visited caves / mines, or had contact with or eaten primates, antelopes or bats in a Marburg / Ebola endemic area? [https://www.gov.uk/ebola-and-marburg-haemorrhagic-fevers-outbreaks-and-case-locations] OR
- Has the patient travelled in an area where Crimean-Congo Haemorrhagic Fever is endemic (http://www.who.int/csr/disease/crenue/index.html) AND sustained a tick bite or crushed a tick with their bare hands OR had close involvement with animal slaughter? [*If an obvious alternative diagnosis has been made e.g. tick typhus, then manage locally]

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START

Does the patient have a fever (≥37.5°C) OR history of fever in past 24 hours?

NO

VHF Unlikely; manage locally

YES

Has the patient developed symptoms within 21 days of leaving a VHF endemic country? (See above info box for data on VHF endemic countries)

NO

VHF Unlikely; manage locally

YES

Has the patient cared for / come into contact with body fluids or handled clinical specimens (blood, urine, faeces, tissues, laboratory cultures) from an individual or laboratory animal known or strongly suspected to have VHF within the past 21 days?

NO

VHF Unlikely; manage locally

YES

High Possibility of VHF
- ISOLATE PATIENT IN A SIDE ROOM
- Urgent Malaria investigation
- Full blood count, U&E, LFTs, clotting screen, CRP, glucose, blood cultures
- Inform laboratory of possible VHF case (for specimen waste disposal purposes if confirmed)

LOW POSSIBILITY OF VHF
- Urgent Malaria investigation
- Urgent local investigations as normally appropriate, including blood cultures

Malaria test POSITIVE?

YES

Manage as Malaria; VHF unlikely

NO

Has the patient returned from a VHF epidemic country (Ebola: Sierra Leone, Guinea, Liberia or Mali)?

NO

NO

Clinical concern OR continuing fever after 72 hours?

YES

MANAGEMENT OF CLINICAL CONCERN

NO

Does the patient have extensive bruising or active bleeding?

NO

Manage as malaria, but consider possibility of dual infection with VHF

YES

HIGH POSSIBILITY OF VHF
- ISOLATE PATIENT IN A SIDE ROOM
- Urgent Malaria investigation
- Full blood count, U&E, LFTs, clotting screen, CRP, glucose, blood cultures
- Inform laboratory of possible VHF case (for specimen waste disposal purposes if confirmed)

Malaria test NEGATIVE?

YES

Discuss with Infection Consultant (Infectious Disease/Microbiology/Virology)
- Infection Consultant to discuss VHF screen with Imported Fever Service (0844 7788990)
- Notify Local Health Protection Unit
- Consider empiric antimicrobials

NO

YES

Is the patient fit for outpatient management?

YES

Admit

NO

NO

VHF test POSITIVE?

YES

VHF unlikely; manage locally

NO

CONFIRMED VHF
- Contact High Level Isolation Unit for transfer (020 7794 0500: Royal Free)
- Launch full public health actions, including categorisation and management of contacts
- Inform lab if other lab tests are needed

INFECTION CONTROL PERSONAL PROTECTION MEASURES:

MINIMAL RISK
Standard precautions apply:
- Hand hygiene, gloves, plastic apron
- (Eye protection and fluid repellent surgical facemask for splash inducing procedures)

STAFF AT RISK
- Hand hygiene, double gloves, fluid repellent disposable coverall or gown, full length plastic apron over coverall/gown, head cover e.g. surgical cap, fluid repellent footwear e.g. surgical boots, full face shield or goggles, fluid repellent FFP3 respirator
Febrile Patient (over 38°C) returned from West Africa in the last 21 days (specifically Guinea, Liberia or Sierra Leone)

- Isolate patient with enhanced precautions: hand hygiene, gloves, disposable long sleeved gown, FFP3 mask, eye protection (ED cubicle 5)
- Consult with microbiologist (CMM), prior to taking any bloods
- CMM will liaise with Imported Fever Service to arrange VHF screen.
- Inform Clinical Site Managers and IPCT
- Inform Emergency Planning Officer

**High risk**

E.g. patient suffering major haemorrhage, uncontrolled diarrhoea and vomiting

- Employ enhanced infection control precautions, hand hygiene, fluid repellent disposable long sleeved gown, double gloves, FFP3 mask, eye protection.
- Arrange transfer to Room 6 ICU
- CMM to contact CCDC

Lead Clinician to discuss blood tests with CMM, ie Malaria screen, bloods essential for patient management and EDTA, and clotted blood (serum) from VHF screen.

Ensure all specimens are transported in Category A Waste Containers available from ED, ICU and EAU.

**Patient Transfers**

Plan the route and close to public; patient to wear mask; minimal equipment to be on the trolley; staff to wear full PPE as indicated above, including additional staff member who should follow with a spillage kit in case needed.

**Positive Screen**

Contact High Level Isolation Unit for Transfer to Royal Free Hospital

**Negative Screen**

Manage locally

Nurse in Charge to inform On call Manager of outcome of investigations.
17. **APPENDIX A**

**Summary of Infection Control Precautions for patient with ‘possibility of VHF’, a ‘high possibility of VHF’, or ‘confirmed VHF’**

Viral haemorrhagic fevers are highly contagious and person to person transmission can occur through direct contact (through mucous membranes or broken skin) with blood or bodily fluids, and indirect contact with environments contaminated with splashes or droplets of blood or body fluids.

The following actions and enhanced infection control precautions must be taken for all patients with ‘possibility of VHF’, a ‘highly possibility of VHF’, or ‘confirmed VHF’.

If the patient is categorised as ‘unlikely to have VHF’ standard infection control precautions should be applied.

<table>
<thead>
<tr>
<th></th>
<th><strong>Low possibility of VHF</strong></th>
<th><strong>High possibility of VHF</strong></th>
<th><strong>Confirmed VHF</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isolation</strong></td>
<td>Single room with en-suite facilities or dedicated commode/toilet</td>
<td>Negative pressure isolation room with en-suite facilities as soon as possible. Until this is available, patients can be nursed in a side- room with en-suite facilities</td>
<td>Immediate isolation in a negative pressure isolation room on ICU and arrange for urgent transfer to HLIU (refer to Appendix D for contact details and Appendix B for transfer information )</td>
</tr>
<tr>
<td></td>
<td>Do not transfer patient off the ward without discussion with IPC</td>
<td>Do not transfer patient off the ward without discussion with IPC</td>
<td></td>
</tr>
<tr>
<td>Personal Protective Equipment (PPE)</td>
<td>Only staff who have been \textit{trained} to safely don and remove PPE should enter the room of a patient with symptoms of bruising, bleeding diarrhoea or vomiting. Always use a buddy to assist with PPE removal.</td>
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<td></td>
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<tr>
<td></td>
<td>Before entry to room;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Long sleeved plastic gown</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• FFP3 facemask*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Disposable visor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If bruising, bleeding or uncontrolled diarrhoea or vomiting develops, the patient should be re-categorised as ‘high possibility of VHF’ and enhanced PPE must be worn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before entry to room;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Containment suit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Long sleeved plastic gown over suit</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Disposable visor</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• FFP3 face mask*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Overboots / overshoes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Double gloves</td>
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<td></td>
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<tr>
<td></td>
<td>Before entry to room;</td>
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<td></td>
<td>• Containment suit</td>
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<tr>
<td></td>
<td>• Disposable visor</td>
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<td></td>
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<tr>
<td></td>
<td>• FFP3 facemask*</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Overboots / overshoes</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Double Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand Hygiene</td>
<td>• Clean hands with soap and water or alcohol gel before donning PPE</td>
<td></td>
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<tr>
<td></td>
<td>• Clean hands with soap and water and dry carefully prior to leaving the isolation room.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>- Gel inner gloves prior to visor removal</td>
<td></td>
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<tr>
<td></td>
<td>- Gel inner gloves again prior to unzipping suit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Clean hands with soap and water once all PPE has been removed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposal of waste</td>
<td>All waste to be disposed of as Category B waste (i.e. clinical waste)</td>
<td>Treat all waste as Category A waste <a href="https://example.com">(Appendix E)</a></td>
<td>Treat all waste as Category A waste (Appendix E)</td>
</tr>
<tr>
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<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td></td>
<td>All waste generated should be put into clinical waste bags must be double bagged in clinical waste bags</td>
<td></td>
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<tr>
<td></td>
<td>Quarantine all waste inside patient's room</td>
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<tr>
<td></td>
<td>Notify Facilities Manager on extension 5459 / 5276 that Category A waste is being generated</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Any waste generated prior to VHF being suspected should be retrieved if possible and quarantined in the patient’s room</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>If the malaria screen is positive and VHF is excluded then clinical waste can be disposed of in the normal way in patient’s room</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>All waste generated should double bagged in clinical waste bags</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quarantine all waste inside patient’s room</td>
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<td></td>
<td>Any waste generated prior to VHF being suspected should be retrieved if possible and quarantined in the patient’s room</td>
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</tr>
<tr>
<td><strong>Specimens</strong></td>
<td>Standard infection control precautions</td>
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<tr>
<td>--------------</td>
<td>---------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• PPE, as above</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Waste, as above</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Do not use POD system for specimen transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Transport specimens in sealed, designated container</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Treat all specimen waste as Category A infectious waste (see above)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• See Appendix C for further information</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Disposal of Bodily Fluids</strong></th>
<th>Standard infection control precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• An ambulant and self-caring, patient can use a toilet designated for their sole use</td>
</tr>
<tr>
<td></td>
<td>• Absorbent gel granules should be used to solidify all liquid waste</td>
</tr>
<tr>
<td></td>
<td>• If using commode, bedpan or urinal then solid waste should be double bagged in clinical waste bags</td>
</tr>
<tr>
<td></td>
<td>• Bed pans and urinals must be disposed of as clinical waste (do not macerate)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Essential specimens only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPE, as above</td>
</tr>
<tr>
<td></td>
<td>Waste, as above</td>
</tr>
<tr>
<td></td>
<td>Do not use POD system for specimen transport</td>
</tr>
<tr>
<td></td>
<td>Transport specimens in sealed, designated container</td>
</tr>
<tr>
<td></td>
<td>Treat all specimen waste as Category A infectious waste (see above)</td>
</tr>
<tr>
<td></td>
<td>See Appendix C for further information</td>
</tr>
<tr>
<td>Handling Linen</td>
<td>Standard infection control precautions</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Accidental Exposure to Potentially Infectious Material</td>
<td>See Appendix H</td>
</tr>
</tbody>
</table>
| Blood/ Bodily Fluid Spillage | Standard infection control precautions | • Wearing personal protective equipment as detailed above, the spillage should be covered with a hypochlorite powder and left for 2 minutes, then wiped up using paper towels and discarded as clinical waste.  
• Large spillages should be wiped up using the spillage kit (available from theatres or ED  
• Disinfect the surface with a chlorine dioxide solution (e.g. Actichlor Plus).  
• See Appendix F for further details. | • Wearing personal protective equipment as detailed above, the spillage should be covered with a hypochlorite powder and left for 2 minutes.  
• Then wipe up the spillage using paper towels and discard as clinical waste (double bag).  
• Disinfect the surface with a chlorine dioxide solution (e.g. Actichlor Plus).  
• See Appendix F for further details. |
<table>
<thead>
<tr>
<th><strong>Equipment</strong></th>
<th><strong>Standard infection control precautions</strong></th>
<th><strong>Visitors</strong></th>
<th><strong>Limit visitors until VHF has been excluded</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Single use (disposable) equipment and supplies should be used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Disposable crockery and cutlery.</td>
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<tr>
<td></td>
<td>• All used disposable equipment should be treated as Category A waste</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Non disposable equipment should be designated for the patient's use only (e.g. commode)</td>
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<tr>
<td></td>
<td>• DO NOT remove equipment from the room without permission of IP&amp;C</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Single use (disposable) equipment and supplies should be used.</td>
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<td></td>
<td>• DO NOT remove equipment from the room without permission of IP&amp;C</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Essential visitors only</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Any visitor should wear personal protective equipment as detailed above and a list of visitors entering the room should be kept (Appendix G).</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Essential visitors only</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Any visitor should wear personal protective equipment as detailed above and a list of visitors entering the room should be kept (Appendix G).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Last Offices** | **Standard infection control precautions** | • If VHF remains unconfirmed follow guidelines as if confirmed | • Refer to Appendix I  
• PPE as above  
• Place the body in a double body bag with absorbent material (such as inco pads) should be placed between each bag and the bag should then be sealed.  
• The outside of the bag should then be cleaned with a chlorine dioxide solution (e.g. Actichlor plus)  
• The body should be left in the isolation room until advice from the CCDC regarding removal has been obtained.  
• A post-mortem examination should not be carried out on a person known or suspected of having VHF. |
| **Cleaning** | **Standard infection control precautions** | • If VHF remains unconfirmed follow guidelines as if confirmed | • PPE as above  
• All surfaces and non-disposable equipment should be cleaned with a detergent and chlorine dioxide solution (e.g. Actichlor Plus).  
• Cleaning should only be undertaken by staff trained to safely don and remove PPE |
**Terminal Cleaning of Room**

| Standard infection control precautions | If VHF remains unconfirmed follow guidelines as if confirmed | PPE as above  
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All surfaces and non-disposable equipment should be cleaned with a detergent and chlorine dioxide solution (e.g. Actichlor Plus).</td>
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<tr>
<td></td>
<td></td>
<td>Curtains should be sealed in a clinical waste bag prior to disposal (see above for correct disposal of clinical waste)</td>
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<tr>
<td></td>
<td></td>
<td>Cleaning must be completed using hydrogen peroxide vapour (HPV) system before room can be used again</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cleaning should only be undertaken by staff trained to safely don and remove PPE.</td>
<td></td>
</tr>
</tbody>
</table>

**Contacts**

| Records not necessary | Maintain a list all staff and visitors who have contact with patient (Appendix G) | Maintain a list all staff and visitors who have contact with patient (Appendix G) |

*FFP3 Respirator masks* should be worn when undertaking **aerosol generating procedures** (AGPs) which are procedures that generate an aerosol from the patients' secretions..

The following procedures are considered AGPs:

- Intubation, extubation and related procedures, for example manual ventilation and open suctioning
- Cardiopulmonary resuscitation
- Bronchoscopy
• Surgery and post mortem procedures in which high-speed devices are used
• Non Invasive Ventilation (NIV) e.g. Bilevel Positive Airway Pressure Ventilation (BiPAP) and Continuous Positive Airway Pressure Ventilation (CPAP)
• High Frequency Oscillatory Ventilation (HFOV)
• Induction of sputum

The following procedures may generate an aerosol from material other than patients’ secretions but are NOT considered to represent a significant infectious risk:
• Administration of pressurised humidified O2
• Administration of medication via nebulisation
TRANSFER OF A PATIENT WITH HIGH POSSIBILITY OR CONFIRMED VHF WITHIN THE UK

- Transfer of a patient within the UK to an HLIU will be necessary when either: the patient has been categorised as ‘high possibility of VHF’ and has bruising or bleeding or uncontrolled diarrhoea or uncontrolled vomiting; or the patient has had positive VHF screen result.

- The decision to transfer a patient should be made by the Lead Clinician responsible for the patient's care, after consultation and agreement with clinicians at the HLIU to which the patient is to be transferred. Only patients with confirmed VHF should be transferred to HILU, however in exceptional circumstances patients may be transferred before diagnosis is confirmed.

- Transfer by road, in an ambulance, is the preferred option for all patients. VHF's are classified as Ambulance Category 4 infectious diseases across all Ambulance Trusts in England, Scotland, Wales and Northern Ireland. Thus all transfer by ambulance in the UK will need to be carried out at Ambulance Category 4.

- There are two Ambulance Trusts in the UK who will carry out transfer of a VHF patient – the North East Ambulance Service and the London Ambulance Service.

- Pregnant staff can decline to accompany the transfer of a Category 4 patient.

- Patients categorised as ‘possibility of VHF’ may be transported by standard means provided that there are no other high risk factors. See VHF Risk Assessment Annex A or via this link http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317135155050

- The ambulance crew and staff must be made aware of the patient's clinical condition, the possibility of deterioration on the journey and the routes of transmission of VHF.

- In extraordinary circumstances, transfer of a patient presenting an enhanced risk to crew and staff (due to bleeding, uncontrolled diarrhoea, uncontrolled vomiting) could be requested. In such circumstances, transfer could be carried out using a transit isolator available from the HLIU. Special instructions and guidance will be supplied by the HLIU staff.

- Although road transfer is preferable, air transfer may be necessary in some circumstances. Following advice and contacts provided by the receiving HLIU, an ambulant and continent patient may be moved by air ambulance with a crew suitably trained for this level of transport.
SPECIMEN COLLECTION FROM PATIENTS CATEGORISED AS ‘LOW POSSIBILITY’ OR ‘HIGH POSSIBILITY’ OF VHF

- Before samples are collected please contact the Essential services Laboratory at MPH. Out of hours, please contact the laboratory scientist on blood sciences and microbiology.

- Healthcare workers must select PPE in accordance with the risk category of the patient (i.e. low or high possibility of VHF, see Figure 1 VHF Risk Assessment and Appendix A).

- Blood must only be taken by a doctor or a nurse experienced in phlebotomy – (unfamiliar procedures are more likely to lead to accidents and spillages). Blood collection by finger prick should not be undertaken.

- Vacuum blood sampling system must be used.

- Any sample bottles or tubes should be labelled with the patient’s details before filled. Urine specimens should only be taken by experienced staff (a 20ml syringe should be used to transfer urine from a bedpan to the specimen container).

- A dry gauze swab (not alcohol swab) should be used to apply pressure to venepuncture wound.

- All equipment used for taking blood must be placed in dedicated sharps box for immediate sealing (see disposal of waste in Appendix E).

- Clinical waste should be double bagged into clinical waste bags (see disposal of waste in Appendix D).

- Place samples in each group below into the appropriate container (Container 1, 2 and 3)

Specimens required for patients categorised as ‘low possibility of VHF’

Send an urgent Malaria screen. Other initial investigations may include FBC, U&Es, LFTs, glucose, CRP, clotting screen, blood cultures, urine and stool. The laboratory should be notified prior to sending the samples.

Specimens required for patients categorised as ‘high possibility of VHF’

Send the samples as shown below. The laboratory must be notified prior to sending.
<table>
<thead>
<tr>
<th>Container 1</th>
<th>Microbiology</th>
<th>1 x EDTA requesting malaria Film</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Blood Cultures</td>
</tr>
<tr>
<td>Container 2</td>
<td>Microbiology for Reference Laboratory</td>
<td>1 x EDTA requesting Ebola / VHF Investigations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 x Serum requesting Ebola / VHF Investigations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 x Urine Sample</td>
</tr>
<tr>
<td>Container 3</td>
<td>Blood Sciences</td>
<td>1 x EDTA for FBC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 x Serum for U&amp;Es</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 x Clotting bloods</td>
</tr>
</tbody>
</table>
**Labelling and Transport of specimens to the Essential Services Laboratory at MPH**

Samples from patients categorised as a ‘low possibility’ or ‘high possibility of VHF’ should be transferred to the laboratory in person or by porter. **Do not send specimens via the pneumatic air tube system (POD)**

Please make sure that the container label is filled correctly and all of the actions listed have been taken.

<table>
<thead>
<tr>
<th>Each Category A Specimen box will have a security seal label and a VHF container with absorbent material and bubble wrap.</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Labelled VHF container" /> These will be kept in ED and Barrington.</td>
<td>• Please place specimens in the appropriate labelled container as indicated in Figure 3. and as per the instructions below. (Three containers in total).</td>
</tr>
<tr>
<td><img src="image2" alt="Category A Specimen Box with Security Seal" /></td>
<td>• Labelled samples should be placed in the bubble wrap provided inside the container, along with the absorbent material.</td>
</tr>
<tr>
<td></td>
<td>• Request forms should be placed within the container and the lid screwed on securely.</td>
</tr>
<tr>
<td></td>
<td>• Place the container inside the Category A Specimen Box.</td>
</tr>
<tr>
<td></td>
<td>• Seal the box with the Security seal label provided.</td>
</tr>
</tbody>
</table>
### USEFUL NUMBERS AND CONTACTS

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant Medical Microbiologist (CMM)</td>
<td>In hours; 01823 343765</td>
</tr>
<tr>
<td></td>
<td>Out of hours; contact the on call Consultant Medical Microbiologist via switchboard</td>
</tr>
<tr>
<td>Infection Prevention and Control (IPC) Team</td>
<td>In hours; ext 4401 or mobile 5401</td>
</tr>
<tr>
<td></td>
<td>Out of hours; contact the on call CMM via switchboard or the Clinical Site team</td>
</tr>
<tr>
<td>Pathology laboratory (MPH)</td>
<td>In hours; 01823 342281</td>
</tr>
<tr>
<td></td>
<td>Out of hours (Laboratory manager); 07747272408</td>
</tr>
<tr>
<td>Hotel services</td>
<td>Ext -</td>
</tr>
<tr>
<td>Duty Consultant of at the Devon, Cornwall and Somerset Public Health England Centre</td>
<td>In hours; 0300 303 8162</td>
</tr>
<tr>
<td></td>
<td>Out of hours contact the PHE switchboard on the number above and ask for the Health Protection 1&lt;sup&gt;st&lt;/sup&gt; on-call</td>
</tr>
<tr>
<td>Imported Fever Service</td>
<td>Tel: 0844 778 8990</td>
</tr>
<tr>
<td>Reference laboratories</td>
<td>Rare and Imported Pathogens Laboratory (RIPL)</td>
</tr>
<tr>
<td></td>
<td>PHE Porton</td>
</tr>
<tr>
<td></td>
<td>Porton Down Salisbury</td>
</tr>
<tr>
<td></td>
<td>Wiltshire</td>
</tr>
<tr>
<td></td>
<td>SP4 0JG</td>
</tr>
<tr>
<td></td>
<td>Tel: 01980 612100 (24 hour)</td>
</tr>
<tr>
<td></td>
<td>The Imported Fever Service will usually direct samples to RIPL. In unusual circumstances samples may be directed to Colindale.</td>
</tr>
<tr>
<td></td>
<td>Microbiology Services Division – Colindale</td>
</tr>
<tr>
<td></td>
<td>61 Colindale Avenue</td>
</tr>
<tr>
<td></td>
<td>Colindale London NW9 5HT</td>
</tr>
<tr>
<td></td>
<td>Tel: 0208 200 4400 or 0208 200 6868 (24 hour)</td>
</tr>
</tbody>
</table>
| High Level Isolation Unit | Royal Free Hampstead NHS Trust, London  
Telephone (24 hrs, ask for infectious disease physician on call) 020 7794 0500 or 0844 8480700  
(local rate number when calling from outside London) www.royalfree.nhs.uk |
Category A

- This is for patients classified as ‘high possibility of’ or ‘confirmed’ VHF infection.
- Notify the Facilities Officer (5459) or Facilities Manager (5276) that Category A waste is being created. Facilities will need to be notified of the disease they are dealing with e.g. VHF. Facilities with then notify the waste contractor who will arrange safe transport and disposal.
- Ensure soft wastes are placed into class 6.2 approved packaging. This will comprise:
  - Watertight primary receptacle.
  - A watertight secondary packaging.
  - Other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them.
  - All packaged Category A waste is to be placed in a yellow lidded waste cart, labelled with a ‘UN2814’ sticker. The waste must remain securely locked away until collection by the waste contractor.
  - The waste contractor will collect the waste, and take it to a predetermined disposal facility for high temperature incineration.
  - Do not attempt to dispose of Category A waste without notifying the Facilities Officer or Facilities Manager. Do not dispose of any Category A wastes in the usual clinical waste manner.

Category B

- Waste generated from patients classified as ‘highly unlikely to have’ or ‘low possibility of having’ a VHF infection is known as Category B waste, and should be treated as normal clinical waste.
APPENDIX F

SPILLAGES OF BLOOD OR BODY FLUIDS

Small spillages

- Wear gloves
- Cover lesions on exposed skin with a waterproof dressing
- Cover spillage with hypochlorite and leave for 2 minutes
- Use paper towels to wipe up spillage and dispose of in double bagged clinical waste
- Clean surface with Actichlor Plus

Larger spillages

As per small spills, but in addition;

- Consider whether extra PPE is required, e.g. rubber boots or plastic overshoes and face protection if splashing is possible
- Allow any potential aerosols to settle
- Use large spillage kit (available from theatres or ED)
DECONTAMINATION, INCLUDING TREATMENT OF LAUNDRY

- VHF s are enveloped viruses. This type of virus has been shown to be susceptible to a broad range of disinfectants including chlorine and alcohol and to thermal inactivation (1 hour at 58-60 °C, or 30 minutes at 75°C). There is no evidence to suggest that they have any greater resistance to inactivation than other enveloped or blood borne viruses such as HIV. Therefore it can be assumed that decontamination methods used against blood borne viruses will be effective.

- Survival of viruses outside the body is dependent on several factors. For example, Ebola virus survival on different surfaces is dependent on a number of environmental factors (type of surface, humidity, light concentration of virus present, etc.). It can survive for several hours when dried onto surfaces such as doorknobs and worktops, and up to several days in body fluids such as blood at room temperature. However, it is easily inactivated at higher temperatures and by soap and water.

- For patients categorised as low possibility of VHF, standard precautions, cleaning and decontaminating procedures apply, including the treatment of laundry. All procedures should be in keeping with those used when caring for a patient with malaria.

- The information in this appendix applies to those patients who have been categorised as high possibility of VHF or have been confirmed with VHF infection.

- Materials or equipment requiring decontamination may be segregated and stored whilst awaiting PCR rest results if facilities are available to do so safely. If results confirm patient as negative for VHF, waste can then be treated using standard precautions. However, if it is not practicable to segregate and store pending PCR results then materials from high possibility cases must be decontaminated in the same way as confirmed cases as outlined in the rest of this Appendix. If test results confirm VHF infection, procedures as in this appendix shall then be applied.

- Staff should ensure that areas and equipment used for the care of patients who have been categorised as high possibility of VHF or have been confirmed with VHF infection are decontaminated and cleaned following the procedures in this appendix. Decontamination and cleaning must be conducted wearing appropriate PPE. (See appendix 8 for general principles and apply local rules for specific PPE and procedures). For information on decontamination or ambulance vehicles see IHCD Ambulance Service Basic Training Manual, 2008, section 17.5 Category 4 Infections.

- It is important to ensure that products used in the decontamination procedure have been validated as effective against blood-borne viruses. Control measures against such viruses in clinical settings are described in recently updated ACDP guidance on blood-borne viruses.
BLEACHES, HYPOCHLORITES AND CHLORINE RELEASING AGENTS

In various protocols and guidance, reference will be made to bleach or hypochlorite solution. To clarify:

- The active disinfectant component of bleach is sodium hypochlorite (NaOCl)
- Typical household bleach is a solution of sodium hypochlorite generally containing 50,000ppm (5%) available chlorine
- It is important to check the concentration in the formulation before use, as it is likely to require dilution
- The strength of the bleach may reduce with long-term storage
- Typical in-use concentrations are 10,000ppm (1%) for the disinfection of blood-spills and 1,000ppm (1%) for general environmental cleaning
- Sodium dichloroisocyanurate (NaDCC) may be used as an alternative to NaOCl. This is also available in granule form, which may be practical to absorb, contain and disinfect spills. Refer to suppliers’ instructions for in-use concentrations
- Gloves should be suitable for use and inspected before they are put on to ensure that they are intact. Where the task involves using chemicals such as chlorine-based products, the gloves should be certified as suitable for chemical resistance and comply with PPE directive.
- Ensure adequate ventilation when disinfecting areas with chlorine-based products i.e. open windows or doors where necessary.

RECOMMENDED PROCEDURES WHEN THERE HAS BEEN NO OBVIOUS CONTAMINATION BY BLOOD AND/OR BODILY FLUIDS

- Validated standard washing and cleaning methods can adequately treat areas and equipment, which have not been contaminated with blood, bodily fluids or laboratory specimens.

RECOMMENDED PROCEDURES WHEN THERE HAS BEEN CONTAMINATION BY BLOOD AND/OR BODILY FLUIDS

- VHF viruses have been known to survive for 2 weeks or even longer on contaminated fabrics and equipment. Persons carrying out decontamination and cleaning procedures must wear appropriate PPE and use suitable disinfectant products determined by a robust risk assessment.
- Disposable cookery and crockery should be used where possible for those patients categorised as high possibility or confirmed VHF. Subject to risk assessment, these items should be disposed of as category A waste.
- Toilets or commodes may be used by patients categorised as ‘high possibility’ or ‘confirmed’ for VHF infection. Where commodes are employed, a dedicated commode should be used with a disposable bowl. After use, the contents are to be solidified with high-absorbency gel and then autoclaved or incinerated.
Toilets and commodes should be disinfected with hypochlorite containing 10,000ppm available chlorine at least daily, preferably after each use, and upon patient discharge. For non-ambulant patients, disposable bedpans should be used and the contents to be solidified with high-absorbency gel and then autoclaved or incinerated.

The use of disposable linen should always be considered when appropriate, in particular when caring for a patient with a ‘high possibility of’ or ‘confirmed’ VHF infection. Subject to risk assessment, this linen may need to be treated and disposed of as category A waste.

All re-useable linen from patients with ‘confirmed’ VHF infection should not be returned to laundry and must therefore be treated and disposed of as category A infectious waste.

All re-useable linen from patients classified as ‘high possibility’ may be segregated and safely stored whilst awaiting PCR test results if facilities are available. However, if it is not practicable to segregate and store pending PCR results then waste from ‘high possibility’ cases must be treated as category A. If PCR results subsequently confirm the patient as negative for VHF, re-useable linen can then be treated as category B.

Following the discharge of a confirmed VHF positive patient, HLIU wards will need to be decontaminated by fumigation. Rooms used to house confirmed VHF patients in a non-specialist IDU will also need to be decontaminated via fumigation. This procedure will need to be carried out following a thorough risk assessment and in consultation with HLIU staff.

**SPILLAGE OF BLOOD OR BODY FLUIDS**

For small spots of blood or small spills:

- The surface should be washed with warm water and detergent
- All waste, including gloves and paper towels, should be autoclaved or incinerated

For larger spills:

- Where possible, allow any potential aerosols to settle out
- Towels, gloves, disposable overshoes and any contaminated clothing should be autoclaved or incinerated, according to local protocols. Rubber boots may be cleaned then disinfected with hypochlorite solution containing 10,000ppm available chlorine (1%; 1 in 5 dilution of typical bleach).

**ROOM FUMIGATION**

- In order to ensure successful room decontamination, gross contamination will need to be cleaned and disinfected appropriately prior to the fumigation process
- The fumigation process should be validated as effective against the target agent.
- Vaporised hydrogen peroxide and formaldehyde are known to be effective against VHF’s
• Specialist advice should be sought for undertaking the fumigation process. A risk assessment should be prepared which provides a safe system of work. All staff involved must be fully trained and follow the procedures outlined in the risk assessment.

• It may be necessary to move nearby patients to a more suitable location prior to the fumigation procedure.

• Rooms to be fumigated must be suitably sealed so as to prevent leakage of fumigant and ensure that levels of fumigant in adjacent areas do not exceed the Workplace Exposure Limit (WEL).

• Before entering the room after fumigation, it is necessary to ensure levels of fumigant are below the WEL.

• After fumigation, rooms should be cleaned following locally established protocols.
**PHE CATEGORISATION AND MANAGEMENT OF CONTACTS**

In the event of a confirmed case of VHF, Public Health England will assign a Monitoring Officer to monitor the higher risk contacts and the follow up actions to be taken. Each individual contact will be assessed according to the categories in the table below.

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Description</th>
<th>Action and Advice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unclear</strong></td>
<td>Not sure of contact.</td>
<td>Reassure about absence of risk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise to contact the Monitoring Officer* should they recall any contact.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide general factsheet</td>
</tr>
<tr>
<td><strong>No risk (Category 1)</strong></td>
<td>No contact with the patient or body fluids.</td>
<td>Reassure about likely absence of risk.</td>
</tr>
<tr>
<td></td>
<td>Casual contact, e.g. sharing a room with the patient,</td>
<td>* Provide category 1 factsheet.</td>
</tr>
<tr>
<td></td>
<td>without direct contact with body fluids or other potentially infectious</td>
<td></td>
</tr>
<tr>
<td></td>
<td>material.</td>
<td></td>
</tr>
<tr>
<td><strong>Low risk (Category 2)</strong></td>
<td>Direct contact with the patient,</td>
<td>Reassure about low risk;</td>
</tr>
<tr>
<td></td>
<td>e.g. routine medical/nursing care, handling of clinical / laboratory</td>
<td><strong>Passive monitoring</strong></td>
</tr>
<tr>
<td></td>
<td>specimens or handled body fluids, and wore personal protective equipment</td>
<td>Self-monitor for fever and other disease compatible symptoms for 21 days from last</td>
</tr>
<tr>
<td></td>
<td>appropriately.</td>
<td>possible exposure;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Report to the Monitoring Officer if temperature &gt;37.5°C,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with further evaluation as necessary.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Provide category 2 factsheet.</td>
</tr>
</tbody>
</table>
| High risk (Category 3) | Unprotected exposure of skin or mucous membranes to potentially infectious blood or body fluids, including on clothing and bedding (for healthcare workers see Appendix H). This includes: | Inform about risks; Active monitoring  
Record own temperature daily for 21 days following last contact with the patient and report this temperature to the Monitoring Officer by 12 noon each day, with further evaluation as necessary. | * Inform Monitoring Officer urgently if symptoms develop.  
* Provide category 3 factsheet. |
<table>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• unprotected handling of clinical/laboratory specimens;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• mucosal exposure to splashes;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• needle stick injury;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• kissing and/or sexual contact.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The PHE Duty Doctor [020 8200 6868](tel:020%208200%206868) check number will provide information sheets (general, category 1, category 2 and category 3). These should include contact details for the Monitoring Officer.

**Insert management of patient contacts form**
APPENDIX H

MANAGEMENT OF STAFF ACCIDENTLY EXPOSED TO POTENTIALLY INFECTIOUS MATERIAL

Accidental exposures that need to be dealt with promptly are;

Percutaneous injury e.g. needlestick injury

- Immediately wash the affected part with soap and water. Encourage bleeding via squeezing

Contact with broken skin

- Immediately wash the affected part with soap and water

Contact with mucous membranes (eyes, nose or mouth)

- Immediately irrigate the area with emergency wash bottles, which should be accessible in case of emergency.

In all cases, the incident will need to be reported via the Trust incident reporting procedure and follow-up managed via the Trust Occupational Health provider, with support from Public Health England. These cases should be managed as **High Risk (Category 3)** (see Appendix G).

In all cases, the incident will need to be reported immediately to the local Virologist, Clinical Microbiologist or Infectious Disease Physician.

- For a high possibility ‘suspected’ source case on which VHF testing has not been completed, the local Clinical Virologist, Clinical Microbiologist or Infectious Disease Physician to whom the incident has been reported should immediately discuss it with the duty RIPL physician, contacted by telephoning the Imported Fever Service on 0844 77 88 99 0.

- For a source case in which VHF infection has been confirmed by laboratory testing, the local Clinical Virologist, Clinical Microbiologist or Infection Disease physician to whom the incident has been reported should immediately discuss it with the duty Infectious Disease Physician at the Royal Free Hospital contacted by telephoning the HLIU on 020 7794 0500 or 0844 848 0700.

- In the event that VHF infection in the source patient is excluded by laboratory testing, the recipient of the body fluids exposure incident may still require the appropriate follow-up for possible blood borne virus (HIV, HBV, HCV) exposure, including with their local occupational health provider.

- In the event that VHF infection is confirmed in the source patient, the exposed individual should be followed up as a Category 3 contact- see Section 6 for details. In Great Britain, the incident may need to be reported under Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) to HSE
In Northern Ireland, it may need to be reported under RIDDOR (NI) to HSENI (http://www.hseni.gov.uk/). Under RIDDOR, a definite exposure would be reported as a dangerous occurrence, whereas if the staff member actually acquired an infection it would need to be reported under the occupational disease category.
APPENDIX I

CARE AFTER DEATH

- Due to the occupational and public health risks contact with the body must be limited, including by next of kin. Religious/ritual preparation of the body, washing, dressing, viewing, touching or kissing of the deceased should not take place.

- Staff should wear suitable PPE/RPE (See Appendix A) - hyperlink as recommended prior to death.

- The body of a patient should be placed in a double body bag. Absorbent material (such as inco pads) should be placed between each bag, and the bag sealed and disinfected with an appropriate disinfectant e.g. Actichlor plus

- The bag should be labelled as high risk of infection.

- If VHF has been confirmed or was highly likely, mortuary staff must be contacted prior to transfer of the body.

- The mortuary admission form must be completed.

- PHE advice must be sought regarding suitability of mortuary provision. Temporary mortuary facilities may be required in order to keep the body separated and identified as recommended by national guidance (DH,2014)

- Transfer of the body must be undertaken by staff wearing PPE (See Appendix A) - hyperlink

- Post-mortems should not be carried out on bodies known to be infected with a hazard group 4 biological agent except in specialist facilities (i.e. not YDH)

- Where a patient suspected of having VHF dies prior to a definitive diagnosis, it may be necessary on public health grounds to undertake some diagnostic tests to either establish or eliminate the diagnosis of VHF or to provide an alternative diagnosis including e.g. malaria. Consultation with appropriate specialists e.g. local infectious disease physician or virologist may help to determine the extent of the limited amount of sampling that will suffice such an assessment.

- Personnel undertaking diagnostic tests must wear appropriate PPE and follow the guidance for safe collection and transport of specimens (See Appendix C) - hyperlink.

- Embalming or hygienic preparation of bodies presents an acceptably high risk and should not be undertaken.

- An infection control notification sheet should be completed in readiness for the funeral directors.

- Funeral directors will need to be consulted beforehand and provided with sufficient information of the infection risk normally provided by an infection control notification sheet.

Clothing and personal effects
- The return of clothing, personal effects and valuables should be discussed with relatives. If desired, items can be returned following decontamination.

- Items of clothing visibly contaminated should be safely disposed of (see Appendix E) other items of clothing should be autoclaved prior to laundering.

- Wedding rings, jewellery and other physical artefacts should either be autoclaved or decontaminated using a validated disinfectant e.g. Actichlor plus.

**Repatriation/expatriation**

- If repatriation/expatriation of the deceased’s remains is necessary, refer to Appendix

- 11 of the Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence
  
<table>
<thead>
<tr>
<th>Virus</th>
<th>Disease</th>
<th>Geographical distribution</th>
<th>Transmission routes/vectors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ARENAVIRIDAE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Old World arenaviruses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lassa</td>
<td>Lassa fever</td>
<td>West and Central Africa</td>
<td>Contact with excreta, or materials contaminated with excreta, of infected multimammate rat</td>
</tr>
<tr>
<td></td>
<td><em>Lassa fever – Origins, reservoirs, Transmission and Guidelines – Not the correct hyperlink</em></td>
<td></td>
<td>Inhalation of aerosols of excreta of multimammate rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contact with <strong>blood</strong> or <strong>body fluids</strong> from infected patients, or <strong>sexual contact</strong></td>
</tr>
<tr>
<td>Lujo</td>
<td>Unnamed</td>
<td>Southern Africa</td>
<td>Transmission to the index case unknown. Direct contact with <strong>infected patient, blood</strong> or <strong>body fluids</strong></td>
</tr>
<tr>
<td><strong>New World arenaviruses (Tacaribe complex)</strong></td>
<td>Details of the outbreak and genetic analysis are available</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Viral Haemorrhagic Fever caused by Arenaviruses – hyperlink</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chapare</td>
<td>Chapare Haemorrhagic Fever</td>
<td>Bolivia</td>
<td>Direct contact (e.g. <strong>bite</strong>) with infected <strong>rat</strong> or <strong>mouse</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Direct contact with <strong>excreta</strong> of infected rat or mouse</td>
</tr>
<tr>
<td>Guanarito</td>
<td>Venezuelan Haemorrhagic Fever</td>
<td>Central Venezuela</td>
<td>Contact with <strong>materials</strong> (e.g. <strong>food</strong>) <strong>contaminated with excreta</strong> from infected rat or</td>
</tr>
<tr>
<td>Junin</td>
<td>Argentine Haemorrhagic Fever</td>
<td>Argentina Pampas region</td>
<td></td>
</tr>
<tr>
<td>Virus Type</td>
<td>Location</td>
<td>Clinical Management and Guidance</td>
<td></td>
</tr>
<tr>
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<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Machupo</td>
<td>Bolivian Haemorrhagic Fever</td>
<td>North eastern Bolivia Beni department</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brazil</td>
<td>One case to date</td>
<td></td>
</tr>
<tr>
<td>Sabia</td>
<td>Brazilian Haemorrhagic Fever</td>
<td>Brazil</td>
<td></td>
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</tr>
</tbody>
</table>

**BUNYAVIRIDAE**

- **Nairoviruses**
  - Crimean Congo haemorrhagic fever
  - Central and Eastern Europe, Central Asia, the Middle East, East and West Africa
  - Bite of an infected tick Contact with infected patients, their blood or body fluids

**FILOVIRIDAE**

- Ebola
  - Ebola Virus Disease – Clinical management and Guidance – not correct hyperlink
  - Western, Central and Eastern Africa
  - Outbreaks have occurred in the Democratic republic of Congo, Suda, Uganda, Gabon, Republic of Congo and Cote d’Ivoire
  - Transmission to the index case probably via contact with infected animals
  - Contact with infected blood or body fluids

- Ebola and Marburg
  - Ebola and Marburg Haemorrhagic Fevers – Outbreaks and Case Locations – not correct hyperlink
  - Ebola Zaire Ebola Sudan Ebola Tai Forest (former Cote d’Ivoire)
  - Ebola Bundibugyo Ebola reston and Siena
  - "Ebola reston and Siena" not correct

- Ebola
  - Ebola Haemorrhagic Fever

- Crimean Congo haemorrhagic fever

- Marburg
  - Marburg Haemorrhagic Fever

- Zaire
  - Ebola Zaire

- Sudan
  - Ebola Sudan

- Tai Forest
  - Ebola Tai Forest (former Cote d’Ivoire)

- Bundibugyo
  - Ebola Bundibugyo

- Reston
  - Ebola reston

- Siena
  - Ebola reston and Siena

- Virus transmission
  - Inhalation of aerosols of excreta (often in dust) of rat or mouse
  - Contact with blood or body fluids from infected patients

- **Locations**

  - Crimean Congo
  - Bundibugyo
  - Ebola reston
  - Siena

- **Hemorrhagic Fevers**

  - Ebola
  - Marburg
<table>
<thead>
<tr>
<th>Marburg</th>
<th>Marburg Virus Disease – Origins Reservoirs, Transmission and Guidelines – check correct hyperlink</th>
<th>Central and Eastern Africa</th>
<th>Transmission to the index case probably via contact with infected animals (?fruit bats) Contact with infected blood or body fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marburg</td>
<td>Marburg Haemorrhagic Fever</td>
<td>Central and Eastern Africa</td>
<td>Outbreaks have occurred in the Democratic Republic of the Congo, Suda, Uganda, Gabon, Republic of Congo and Cote D'Ivoire</td>
</tr>
</tbody>
</table>

**FLAVIVIRIDAE**

<table>
<thead>
<tr>
<th>Kyansur forest disease</th>
<th>Kyansur Forest Disease</th>
<th>India Western districts of Karnataka state</th>
<th>Bite of an infected tick Contact with and infected animal, most commonly Haemaphysalis spingera. Contact with an infected animal, most commonly monkeys or rodents Common in young adults exposed in the forests of western Karnataka – approximately 100-500 cases per year. Case fatality rate is estimated at 2-10%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Vector Species</th>
<th>Mode of Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkhurma (Al Khumrah) haemorrhagic fever Alkhurham Haemorrhagic Fever</td>
<td>Saudi Arabia Makkah (Mecca), Jeddah, Jizan, Najran regions</td>
<td>Contact with an infected animal (sheep, camels) Bite of an infected tick or mosquito (principal vector species not yet identified) Cases have been reported outside Saudi Arabia, but have had contact with animals that likely originated in Saudi Arabia e.g. case in an Italian tourist in 2010 who visited a camel market in southern Egypt.</td>
<td></td>
</tr>
</tbody>
</table>