SA Health

South Australian **Contingency Plan for Ebola Virus Disease**

v1.1

Government of South Australia

SA Health

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1. Introduction

Overview

The objective of the South Australian Contingency Plan for Ebola virus disease (EVD) is to provide a guide for a coordinated response within South Australia to suspected, probable and confirmed cases of EVD, and to recommend appropriate management of cases and their contacts.

Scope

This document provides an overarching strategy for Ebola virus disease within South Australia (SA). It is not intended to replace hospital or local health network plans. It does not provide information on national plans or border control measures but this information can be found here http://www.health.gov.au/cdnasongs.

Rationale

This plan is specific for EVD although parts may also be applicable to any of the four types of viral haemorrhagic fever (VHFs) of particular concern, that is: Crimean–Congo haemorrhagic fever (CCHF), Ebola virus disease, Lassa fever and Marburg virus haemorrhagic fever.

These VHFs are severe and life-threatening viral diseases that are endemic to parts of Africa, the Middle East, Eastern Europe, and Asia. VHFs are not indigenous to Australia and environmental conditions here may not support the natural reservoirs and vectors of any of the haemorrhagic fever viruses. It is unlikely in any case that the virus would spread into our animal populations.

These VHFs are of particular public health importance because they can spread via human-to-human contact, they present a particular transmission risk within a hospital setting, they are often associated with a high case fatality rate, they can have a long asymptomatic incubation phase, there is no clear differential symptomatology for these infections; they are difficult to test for, and there are few if any effective specific treatments.

A suspected, probable or confirmed case of one of these VHFs constitutes a public health emergency. The management of VHF patients requires considerable care to prevent further possible transmission. Although the risk and/or mode of transmission differ for each of these viruses, the limited clinical and epidemiological evidence available does not always permit clear distinctions.

Other haemorrhagic fevers that are rarely if ever associated with person to person transmission (such as hantaviruses, yellow fever, severe dengue, or South American arenavirus haemorrhagic fevers) are not specifically covered by this plan. These infections should be managed with the advice of infectious disease (ID) physicians and infection prevention and control staff to ensure that appropriate precautions are undertaken as they may still pose a transmission risk in certain hospital settings, particularly to laboratory staff.

Contingency planning for EVD aims to enable early diagnosis of EVD cases, to provide patients with appropriate clinical care in a safe environment, and to prevent transmission to other people.

Legal basis

VHFs are notifiable conditions and controlled notifiable conditions under the South Australian Public Health Act 2011. VHFs are listed human diseases under the Biosecurity Act 2015 (Cth)". VHFs are included in the list of aetiological agents that need to be assessed in terms of their potential to cause Public Health Events of International Concern (PHEIC) under the International Health Regulations (2005) (Annex 2).[1]

Intended users of this guidance

This guidance is for:

- healthcare staff in emergency departments, infectious disease units, infection control units, microbiology, acute medical units (including intensive care units and high dependency units)
- ambulance and aeromedical retrieval staff, who may be required to transport a patient with confirmed or suspected EVD

- those working in laboratories dealing with specimens from patients in whom EVD is suspected, probable or confirmed
- public health professionals who may be required to carry out public health actions associated with a EVD case
- biosecurity officers at international ports, who may be required to carry out public health actions associated with a suspect EVD case
- mortuary and funeral personnel, who may need to deal with a EVD case.

Roles and responsibilities

The role of the Communicable Disease Control Branch (CDCB)

The role of the CDCB is to coordinate the investigation, transport, and management of all persons under investigation, suspected, probable and confirmed EVD cases. The CDCB is responsible for the public health management of suspected, probable and confirmed EVD cases, and the identification and management of their close contacts during their period of quarantine surveillance. The CDCB works closely with the clinical team caring for the case, SA Pathology and an Incident Control Group (if convened), as required.

The role of the Chief Quarantine Officer (CQO)

The Director of the CDCB is the CQO. The CQO is also responsible for liaising with the Australian Department of Health's Director of Human Quarantine (DHQ), the Chief Public Health Officer, the Communicable Diseases Network Australia (CDNA) and the National Incident Room.

The role of the Chief Public Health Officer (CPHO)

The Chief Public Health Officer would work closely with CDCB, the Emergency Management Unit, the Deputy Chief Executive and Chief Executive to coordinate emergency and hospital responses as required. The CPHO would be most likely to be the media spokesman for SA Health, and would liaise with the Australian Chief Medical Officer and Australian Health Protection Principal Committee (AHPPC).

The Role of SA Health Emergency Management Unit

The Emergency Management Unit (EMU) provides strategic leadership and direction for the implementation and management of SA Health's response to major incidents, emergencies and disasters. During a public health emergency such as a communicable disease outbreak, EMU will support the CPHO and CDCB by facilitating the SA Health Command and Control structure and Department for Health and Ageing (DHA) Incident Management Team.

The role of the Royal Adelaide Hospital (RAH) and the Women's and Children's Hospital (WCH)

EVD is a severe and life-threatening disease for which there is no proven treatment or prophylaxis. Therefore, patients in whom EVD infection is diagnosed should be managed in a quarantine hospital: in South Australia (SA) these are the Royal Adelaide Hospital (adults) and the Women's and Children's Hospital (children). Isolation rooms should be used in order to control and contain the possible spread to healthcare staff, other patients or visitors. Clinical management of a patient with EVD should be undertaken by intensive care and infectious disease (ID) physicians and other specialists as required and on a case-by-case basis; specific treatments cannot be described here.

The role of SA Pathology

SA Pathology, is the SA laboratory equipped to undertake diagnostic testing for patients with suspected, probable and confirmed EVD. No pathology tests should be ordered or tested on a patient with suspected, probable or confirmed EVD without first discussing the case with CDCB and SA Pathology so that suitable arrangements for safe transport and testing of samples can be made.

The role of the South Australian Ambulance Service (SAAS)

SAAS is equipped to transfer suspected, probable or confirmed cases of EVD in South Australia and will apply the case definitions outlined in this plan. SAAS personnel will use infection prevention and control precautions as per their standard operating procedures. Where there are copious amounts of blood or bodily fluid present, additional personal protective equipment (PPE) may be required as described in the management of a suspected, probable or confirmed case of EVD section of this plan.

The role of Local Health Networks (LHN) and Hospitals

Local Health Networks (LHN) must ensure each hospital has in place a contingency plan for the management of patients with suspected EVD infections which includes:

- An isolation care area with an adjoining ante-room and with dedicated ensuite facilities, or at least a dedicated commode, to manage patients until they are transferred (applicable to non-quarantine hospitals only) or until EVD has been excluded or a definitive alternative diagnosis is made.
- Appropriate personal protective equipment (PPE) for healthcare workers managing EVD cases, according to the flowchart 'Emergency department management of patients with suspected Ebola in non-quarantine hospitals' (Appendix A) and guidance in the Ebola Virus Disease Communicable Disease Network Australia (CDNA) National Guidelines for Public Health Units[2].
- The provision of education to healthcare workers on necessary infection prevention and control measures and on the use of required PPE.
- Arrangements for transfer of patients to the RAH (adults) or the WCH (children) as soon as clinically practicable.
- This document aims to provide a framework to assist each LHN and hospital to develop their own contingency plans as part of their emergency management arrangements. Active involvement of infection control, nursing, laboratory and clinical staff is encouraged.

The role of general practice

- Plans are in place to minimise the risk of a person with EVD presenting to general practice. In the unlikely event that a suspected case presents to a practice, the practice should follow the guidance found in the flowchart 'Suspected Ebola? Information for general practitioners' (Appendix B). If a person with suspected EVD telephones the practice, the practice should take their contact details and the practice should immediately contact the CDCB who will carry out risk assessment and further management as indicated.

2. Background

Clinical features of EVD:

- EVD classically presents with a sudden onset of symptoms including:
- fever (≥38°C)
- myalgia
- fatigue
- headache.

The patient may subsequently develop:

- gastrointestinal symptoms such as vomiting and diarrhoea
- neurological symptoms such as confusion and coma
- vascular symptoms such as conjunctival injection, postural hypotension and oedema
- maculopapular rash
- respiratory symptoms such as a sore throat and cough
- prostration.
- After one week, patients may develop a profound electrolyte disturbance, septic shock-like syndrome and progress to multi-organ failure, sometimes accompanied by profuse internal and external bleeding.

Transmission:

Ebola virus is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals.

Ebola virus then spreads from person-to-person via contact with the blood, secretions or other bodily fluids of infected people (living or deceased), and indirect contact with environments contaminated with such fluid.

EVD is not known to be infectious prior to the development of symptoms. EVD becomes more infectious as the disease progresses with maximal infectivity in late disease and in deceased persons.

Data from previous outbreaks suggests EVD is only moderately transmissible in the absence of infection control. Direct contact with infected patients, particularly involving contact with body fluids in late illness or after death, is associated with an increased risk of transmission. In a meta-analysis of 9 studies involving over 30,000 cases, the secondary attack rate for household contacts providing nursing care was 47.9% compared with 2.1% for household members who had direct physical contact but did not provide nursing care.

Healthcare workers can minimise the risk of transmission, in the unlikely event of a case of EVD occurring in South Australia, by being familiar with the appropriate use of standard and additional transmission-based precautions.

3. Patient risk assessment

> The patient risk assessment must 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. The CDCB, an ID physician and clinical microbiologist should also be involved.

A travel history should be taken from anyone who presents to the emergency department with fever or history of fever in the past 24 hours.

The flow chart 'Emergency department management of patients with suspected Ebola in non-quarantine hospitals' (Appendix A) deals with the emergency department management of the patient and the level of staff protection, all of which are dependent on the possibility of EVD infection and the patient's symptoms.

In the unlikely event that a patient with suspected EVD presents to a general practice, the practice should immediately contact the CDCB (see Appendix B 'Suspected Ebola? Information for general practitioners'). After discussion, if EVD is deemed a possibility by the CDCB, CDCB will contact the SAAS duty manager and relevant quarantine hospital to arrange transfer.

Standard infection control precautions based on patient symptoms are paramount to ensure staff are not put at risk while the initial risk assessment is carried out. It is assumed throughout this guidance that staff will be using standard precautions as the norm for all patient care activities.

The patient's EVD risk category can change depending on the patient's symptoms and/or results of diagnostic tests.

4. EVD risk categories

Person under investigation for EVD

Requires clinical evidence and limited epidemiological evidence.

Clinical evidence: fever (≥38°C) or history of fever in the past 24 hours. Additional symptoms such as unexplained haemorrhage or bruising, severe headache, muscle pain, vomiting, diarrhoea, or abdominal pain should also be considered.

Limited epidemiological evidence: travel to an EVD affected area (country/region) in the 21 days prior to onset.

Note: If a risk assessment determines that a person under investigation should be tested for Ebola virus, the person should be managed as a suspected case from that point forward regardless of clinical and epidemiological evidence.

Suspected case of EVD

Requires clinical evidence and epidemiological evidence.

Clinical evidence: fever (≥38°C) or history of fever in the past 24 hours. Additional symptoms such as unexplained haemorrhage or bruising, severe headache, muscle pain, vomiting, diarrhoea, or abdominal pain should also be considered.

Epidemiological evidence: requires a lower risk exposure or higher risk exposure as defined below in the 21 days prior to onset.

Lower risk exposures:

> household contact with an EVD case (in some circumstances this might be classified as higher risk such as where the household was in a resource poor setting)
> being within approximately 1 metre of an EVD case or within the case's room or care area for a prolonged period of time (e.g. healthcare workers, household members) while not wearing recommended PPE
> having direct brief contact (e.g. shaking hands) with an EVD case while not wearing recommended PPE.

Higher risk exposures:

> percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids of an EVD case (either suspected or confirmed)
> direct skin contact with blood or body fluids of an EVD case without appropriate personal protective equipment (PPE)

- laboratory processing of body fluids of suspected, probable, or confirmed EVD cases without appropriate PPE or standard biosafety precautions
- direct contact with a dead body without appropriate PPE in a country where an EVD outbreak is occurring
- direct handling of sick or dead animals from disease-endemic areas, e.g. consumption of “bushmeat” in a country where EVD is endemic.

Note: Exposure to an EVD case in an Australian setting would require the case is probable or confirmed EVD according to laboratory criteria.

Probable case of EVD

Requires clinical evidence and laboratory suggestive evidence.

Clinical evidence: fever (≥38°C) or history of fever in the past 24 hours. Additional symptoms such as unexplained haemorrhage or bruising, severe headache, muscle pain, vomiting, diarrhoea, or abdominal pain should also be considered.

Laboratory suggestive evidence:

- Isolation of virus pending confirmation by Victorian Infectious Diseases Reference Laboratory (VIDRL), Melbourne, or the Special Pathogens Laboratory, Centers for Disease Control and Prevention (CDC), Atlanta or Special Pathogens Laboratory, National Institute of Virology (NIV), Johannesburg;

OR

- Detection of specific virus by nucleic acid testing, antigen detection assay, or electron microscopy pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg;

OR

- IgG seroconversion or a significant increase in antibody level or a fourfold or greater rise in titre to specific virus pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg;

OR

- Detection of IgM to a specific virus pending confirmation by VIDRL, Melbourne, or CDC, Atlanta or NIV, Johannesburg.

Confirmed VHF

Requires laboratory definitive evidence only.

Laboratory definitive evidence:

Laboratory definitive evidence: requires confirmation of EVD infection by VIDRL, Melbourne*, or CDC, Atlanta, or NIV, Johannesburg.

- Isolation of a specific virus

OR

- Detection of specific virus by nucleic acid testing or antigen detection assay

OR

- IgG seroconversion or a significant increase in antibody level or a fourfold or greater rise in titre to specific virus.

* The first case in any outbreak in Australia will also require confirmation by CDC, Atlanta or NIV, Johannesburg.

Note: The risk of VHF in the patient should be reassessed if a patient with a relevant exposure history fails to improve or develops new symptoms of concern.

Note: Specimens from patients with suspected VHF should only be collected following advice from an ID physician, CDCB and the Clinical Microbiologist on call at SA Pathology.

5. Management of a person under investigation

Use level 1 or level 2 PPE as appropriate to the patient's clinical status as per flowchart 'Emergency department management of patients with suspected Ebola in non-quarantine hospitals' (Appendix A) and local hospital policies.

Contact the CDCB on 1300 232 272 as soon as possible for further advice on EVD risk assessment and to discuss any need for EVD testing.

Persons under investigation must not be allowed to leave the hospital except if they are being transferred to another hospital (preferably a quarantine hospital). RAH and WCH are the designated quarantine hospitals and have site specific plans and arrangements for the management of EVD cases.

Where there is a need to test, the person should be classified and managed as a suspected case.

6. Management of a suspected case of Ebola virus disease

Urgent discussion must occur with an ID Physician at the RAH (adults) or the WCH (children), and CDCB.

The treating clinician who is responsible for the acute care of the patient must be a senior member of the medical team.

Inform the patient and those in contact with the patient of the suspected diagnosis, and emphasise infection control procedures to minimise risk of infection.

Patient transfer

Immediate transfer to the RAH (adults) or the WCH (children) must be considered. Discussions must occur with CDCB, referring hospital (or general practice), SAAS duty manager and receiving (quarantine) hospital emergency department and ID team. Method of transfer (i.e. road or air) and appropriate team (e.g. MedSTAR) is determined by SAAS.

Infection control measures

- A patient categorised as a suspected case of EVD should be isolated in a single room immediately.
- There should be dedicated bathroom facilities, preferably an ensuite, or at least a dedicated commode.
- Signage to alert of infectious risk should be placed in the outside of the door.
- Use PPE as per flowchart 'Emergency department management of patients with suspected Ebola in non-quarantine hospitals' (Appendix A) and local hospital policies.
- Patients with respiratory symptoms should also be asked to wear a surgical face mask to contain respiratory droplets prior to placement in the hospital or examination room and during transport.
- Notify the hospital infection control team of the suspected diagnosis.
- Aerosol generating procedures should be avoided wherever possible, however, for unavoidable aerosol-generating procedures use level 2 PPE including a correctly fitted P2 (or higher protection) disposable respirator and eye protection such as visor or full face shield, in a negative pressure room.
- The number of staff in contact with the patient must be restricted.
- Visitors should only be permitted in extreme circumstances (e.g. the well parent of a child case). Visitors must be restricted to well, next-of kin adults. Visitors must follow the same PPE requirements as healthcare workers. Doffing procedures for visitors should be as closely observed as for healthcare workers.
- Keep a log of all who enter the room. If not already completed, compile a list of all staff with exposure prior to commencing the log.
- Single use (disposable) equipment and supplies should be used, or if unavailable, dedicated equipment.
- Guidance on cleaning, disinfection, linen and waste management is provided in the Ebola Virus Disease CDNA National Guidelines for Public Health Units[2] and Ebola: environmental cleaning in the healthcare setting (Appendix C).
- Minimise potential exposures to blood and body fluids. Consider the use of a needle-free intravenous system to eliminate the risk of needle-stick injuries.

Communication with staff about potential infection risks

Staff must be informed about and understand the risks associated with an EVD patient, including:

- the severity of EVD if infection is confirmed
- that virus may be present in blood, in body fluids, including urine, vomitus and faeces, on contaminated instruments and equipment, in waste, on contaminated clothing and on contaminated surfaces.
- that exposure to virus may occur:
  - directly, through exposure (broken skin or mucous membranes) to blood and/or body fluids during invasive, aerosol-generating or splash procedures;
  - indirectly, through exposure (broken skin or mucous membranes) to environments, surfaces, equipment or clothing contaminated with splashes or droplets of blood or body fluids.

Diagnostic investigations

Minimise diagnostic pathology testing. Other diagnoses (e.g. malaria, typhoid, dengue, rickettsia) may be more likely and should be considered. Discuss any proposed diagnostic pathology testing with a clinical microbiologist from SA Pathology. If EVD testing is authorised, results should be available within four hours following receipt of the specimen. Specimens will be sent to VIDRL for confirmation.

Kits for taking and packaging specimens are available from SA Pathology and have been distributed to hospitals as required.

Diagnostic test results and patient management

If EVD testing is negative, although the possibility of the patient having an EVD infection is very unlikely, the patient should remain isolated in a single room, and the infection control measures, including staff protection, maintained. These precautions can be ceased when an alternative diagnosis is confirmed and the patient demonstrates an appropriate response to treatment, or significant clinical improvement occurs such that the diagnosis of EVD is implausible.

7. Management of a probable or confirmed case of Ebola virus disease

It is most likely the case will be in a quarantine hospital (RAH or WCH). Management of patients in quarantine hospitals should be as per hospital protocol. For management of patients in non-quarantine hospitals refer to non-quarantine hospitals protocol at appendix A.

The treating clinician who is responsible for the acute care of the patient must be a senior member of the medical team.

Inform the patient and those in contact with the patient of the positive test, and emphasise infection control procedures to minimise risk of infection.

Public health actions would be instigated (see Public health actions section).

Patient transfer

If a case is not in a quarantine hospital, urgent discussion must occur with an ID Physician at the RAH (adults) or the WCH (children), SAAS and CDCB. Discussions must occur with CDCB, referring hospital (or general practice), SAAS duty manager and receiving (quarantine) hospital emergency department and ID team. Method of transfer (i.e. road or air) and appropriate team (e.g. MedSTAR) is determined by SAAS.

Immediate transfer to the RAH (adults) or the WCH (children) is advised unless exceptional circumstances prevent transfer of the patient. If the condition of the patient is so serious (as judged by the treating clinician) that transfer to the RAH/WCH would adversely affect the patient, an immediate discussion with the head of Infection Control at the hospital, head of the facility and CDCB should take place regarding enhanced risk assessment and control measures. The head of Infection Control should also consult with intensive care specialists.

Infection control measures

- A patient categorised as a probable or confirmed case of EVD should be isolated in a single room immediately, preferably with an anteroom.
- There should be dedicated bathroom facilities, preferably an ensuite.
- Use a negative pressure room, if available, in case aerosol generating procedures are required.
- Signage to alert of infectious risk should be placed on the outside of the door.
- Use level 2 PPE as per flowchart ‘Emergency department management of patients with suspected Ebola in non-quarantine hospitals’ (Appendix A) and local hospital procedures.
- Patients with respiratory symptoms should also be asked to wear a surgical face mask to contain respiratory droplets prior to placement in their hospital or examination room and during transport.
- Notify the infection control team of the positive EVD test result.
- The number of staff in contact with the patient must be restricted.
- Visitors should only be permitted in extreme circumstances (e.g. the well parent of a child case). Visitors must be severely restricted and may include only well, next-of kin adults. Visitors must follow the same PPE requirements as healthcare workers.
- Keep a log of all who enter the room. If not already completed, compile a list of all staff with exposure prior to commencing the log.
- Single use (disposable) equipment and supplies should be used, or if unavailable, dedicated equipment.
- Minimise potential exposures to blood and body fluids. Consider the use of a needle-free intravenous system to eliminate the risk of needle-stick injuries.
- Guidance on cleaning, disinfection, linen and waste management is provided in the Ebola Virus Disease CDNA National Guidelines for Public Health Units[2] and Appendix C.
- Communication with staff about the potential EVD risks and infection control measures is paramount (See Communication with staff about potential infection risks on page 10).

Diagnostic investigations

- Discuss urgent EVD and other appropriate testing with an ID physician, the CDCB, and the Clinical Microbiologist on call at SA Pathology.
- Once the patient is transferred, testing of specimens should be carried out in the high security laboratory at SA Pathology. If the patient is unable to be transferred, testing of specimens for clinical management should be carried out in consultation with SA Pathology.

Treatments for EVD

Treatment for EVD is supportive care. There is currently no specific treatment for EVD proven to be effective.

Discharge and convalescence

A patient with confirmed EVD may be discharged when the medical condition allows. However, virus may be present in the semen, vaginal fluid, and the eye for many weeks. Convalescent patients must be educated about their continuing infectiousness and be meticulous about personal hygiene. While data are limited concerning infectivity in the convalescent period, abstinence from sexual intercourse is advised until genital fluids have been shown to be free of the virus for three months. If the patient does engage in sexual intercourse before testing is completed and virus shown to be cleared, condoms must be used.

8. Public health actions

Probable or confirmed EVD will result in launch of full public health actions, including formation of an Incident Control Team which should include relevant hospital staff, the Chief Public Health Officer, CDCB representatives, staff from Emergency Management Unit, and media adviser. Public health action in response to EVD in South Australia will follow the Ebola Virus Disease CDNA National Guidelines for Public Health Units[2].

Command and Control

The Emergency Management Unit will establish a Department for Health and Ageing Incident Management Team (IMT) and will consult with the Chief Public Health Officer and Director, CDCB on the need to establish the SA Health command & control structure to support the response.

Communicable Disease Control Branch and Hospital Infection Control Team

The identification, management and monitoring of contacts of confirmed, probable and suspected EVD cases is the responsibility of the CDCB. Within hospital settings, the Hospital Infection Control Team or Workforce Health may assist CDCB with follow up.

9. Cleaning

Cleaning of hospital and homes will be carried out as per the Ebola Virus Disease CDNA National Guidelines for Public Health Units[2] and Ebola: environmental cleaning in the healthcare setting (Appendix C).

10. Waste management

Clinical waste will be disposed of as per the guidance in the Ebola Virus Disease CDNA National Guidelines for Public Health Units[2]. Each local health network must ensure systems are in place to manage waste created should a case of EVD occur within their network.

11. Management of the deceased

The care of deceased persons with suspected, probable or confirmed EVD will require the involvement of several agencies and requires sensitivity at all times. Management of deceased persons with suspected, probable or confirmed EVD will be carried out as per the Ebola Virus Disease CDNA National Guidelines for Public Health Units .

1 World Health Organization. International Health Regulations (2005). Available at: http://www.who.int/ihr/9789241596664/en/

2 CDNA (2014). Ebola Virus Disease (EVD) CDNA National Guidelines for Public Health Units. Available at http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola.htm/$File/EVD-SoNG.pdf

Appendix A: Flow chart for emergency department management of Ebola in non-quarantine hospitals

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Emergency Department Management of Patients with Suspected Ebola in Non-quarantine Hospitals

1 Identify exposure history:

Has patient lived in or travelled to a country with community transmission of Ebola (see map) or had contact with an individual with confirmed Ebola within the previous 21 days?

no → Continue with usual triage and assessment.

yes ↓

2 Identify signs and symptoms:

a. Fever (≥38°C) or history of fever in previous 24 hours?

b. Consider additional symptoms such as unexplained bleeding, severe headache, muscle pain, vomiting, diarrhoea, abdominal pain.

no →

a. Continue with usual triage and assessment

b. Monitor for signs and symptoms of Ebola whilst in hospital

c. Discuss with Communicable Disease Control Branch (CDCB) 1300 252 272.

yes ↓ yes ↓ yes ↓

3 Isolate:

Direct or escort the patient to a single room with own bathroom or dedicated commode

> Use room _____ or if occupied, use room _____

> Restrict entry of non-essential staff or visitors

> Keep a log of anyone who enters the room

> Use dedicated or disposable equipment.

4 Inform:

> The CDCB urgently on 1300 252 272

> Infection Control on _____

> Nurse Manager or delegate on _____

> Infectious Disease specialist (where available) on _____

Initiate local contingency plan and urgent transfer to a quarantine hospital, if required.

5 Select PPE:

The use of personal protective equipment (PPE) should be determined based on the patient's clinical status.

> Is the patient exhibiting obvious bleeding, vomiting or copious diarrhoea?

> Does the clinical condition warrant invasive or aerosol-generating procedures (e.g. intubation, suctioning, active resuscitation)?

no ↓ yes ↓

Level 1 PPE

PPE requirements for management of patients being investigated for Ebola **without** vomiting, diarrhoea or bleeding is as for **contact and droplet precautions:**

a. Long-sleeved gown (disposable)

b. Fluid-repellent surgical mask

c. Protective eyewear (**OR** a combined visor/ surgical mask)

d. Disposable gloves.

Level 2 PPE

a. Disposable surgical scrubs (to replace street clothes/uniform)

b. Disposable long-sleeved impermeable gown that extends to at least mid-calf

c. A fit-tested N95/P2 respirator and full-face visor **OR** a PAPR (power air purifying respirator)

d. Disposable fluid-resistant or impermeable leg/foot covers

e. Disposable balaclava or suitable hood to cover head and neck

f. Two pairs of disposable gloves, longer length to cover wrists

g. Disposable impermeable apron.

All staff likely to be caring for such cases must be trained and able to demonstrate competency in donning (putting on) and doffing (taking off) all items of PPE in a safe manner.

6 Other information:

> Consult CDCB (1300 252 272) and SA Pathology on call microbiologist (8222 3123) before taking ANY specimens

> Most patients with suspected Ebola will be transferred to a quarantine hospital (RAH or WCH)

> Other causes for illness such as malaria are much more likely

> For further information refer to www.sahealth.sa.gov.au/Ebola

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Appendix B: Ebola Virus Disease - Information for general practitioners

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Suspected Ebola?[1]

Information for general practitioners

Travel to an EVD affected area in previous 21 days, and or contact with known or suspected Ebola case.

History of fever (current or within past 24 hours)?

Headache, muscle pain, vomiting, diarrhoea, abdominal pain or unexplained bleeding?

1. Isolate in a single room with the door closed. Restrict access.
2. Minimise contact.
3. If contact is unavoidable, use gloves, long-sleeved gown, surgical mask, protective eye-wear and hand hygiene.
4. Do **NOT** take any specimens.
5. **Phone CDCB (1300 232 272) urgently (24/7)** for risk assessment and to arrange hospital transfer if necessary.

Remember

- The risk of Ebola in Australia is **low**.
- Ebola is transmitted by **blood or bodily fluids** from a symptomatic patient.
- Risk of transmission in early disease is low. Risk is highest in late disease (such as when the patient has extensive diarrhoea, vomiting, haemorrhage) and after death.
- **No** airborne spread.
- If a patient with suspected Ebola telephones the practice, take contact details and immediately contact CDCB. Do not make an appointment for the patient.

[1] Official title Ebola virus disease, previously known as Ebola haemorrhagic fever.

Appendix C: Ebola: environmental cleaning in the healthcare setting

Fact Sheet – Ebola[1]

Environmental cleaning in the healthcare setting

This fact sheet covers environmental cleaning of areas used by cases with suspected, probable or confirmed Ebola within healthcare settings.

Ebola viruses are readily inactivated by disinfectants. The preferred disinfectant solution is sodium hypochlorite made up to 1,000 parts per million (ppm) available chlorine (follow the manufacturer's instructions) for routine cleaning, and 5,000 ppm for blood or body fluid spills.

Personal protective equipment

- Wear personal protective equipment (PPE) which covers all skin when undertaking any environmental cleaning. A P2/N95 mask must be worn because cleaning procedures may generate aerosols.
- The following PPE must be worn:
    - P2/N95 mask
    - face shield (preferred) or goggles
    - head cover
    - impermeable long-sleeved gown to mid-calf
    - impermeable shoe and leg covers
    - two pairs of gloves.
- All items should be disposable.

A summary of donning and safe doffing procedures is available by contacting ics@health.sa.gov.au

Routine environmental cleaning and disinfection

- Clean isolation rooms daily as per usual practice.
- At the end of each episode of patient care, the healthcare worker should clean any obvious blood or body fluid surface contamination using a disinfectant wipe. Discard the wipe into the clinical waste bin inside the patient room.
- Clean toilet daily with a 1,000 ppm sodium hypochlorite solution.

Discharge cleaning

- After discharge, clean the entire room with either:
    - a neutral detergent followed by a 1,000 ppm sodium hypochlorite solution (two-step clean) OR
    - a combined detergent/chlorine disinfectant solution (one-step clean).

Refer to *SA Health Cleaning Standard for Healthcare Settings* available from

http://inside.sahealth.sa.gov.au/wps/wcm/connect/non-public+content/sa+health+intranet/business+units/health+system+development/office+of+the+chief+executive/policies/directives/cleaning+standard+for+healthcare+facilities+policy+directive

or by contacting ics@health.sa.gov.au

- Dispose of all cleaning equipment into the clinical waste.

1. Official title Ebola virus disease, previously known as Ebola haemorrhagic fever.

Fact Sheet – Ebola[1]

Body fluid spill

- Where possible, clean spills using a commercial spill kit.
- In the absence of a specific kit, clean spills as follows:
  1. absorb with paper towels
  2. liberally cover with a 5,000 ppm sodium hypochlorite solution and leave to soak for 30 minutes
  3. wipe up the area with disposable cloths
  4. disinfect the area with a 5,000 ppm sodium hypochlorite solution.
- Double bag and dispose of all material into the clinical waste.

Patient equipment and linen

- Limit the equipment that enters the patient's room. Use disposable equipment and linen wherever possible. Any item which enters the patient room must be disposable or dedicated.
- Clean reusable non-critical equipment with a neutral detergent, followed by, 1,000 ppm sodium hypochlorite solution (if material compatible) or 70% alcohol.
- Ensure reusable semi-critical and critical equipment undergoes routine reprocessing (disinfection/sterilisation).

Waste treatment and disposal

- Double bag any items stained or containing body fluids and dispose of into the clinical waste.
- Store waste securely prior to collection.
- Flush the patient toilet, with the lid closed, after each use.
- Use a disposable bed pan for bed bound patients. After use, add high absorbency gelling agent, and once gelled, dispose of entire pan into the clinical waste.

For further information

For further information see Communicable Disease Network Australia (2014). Ebola Virus Disease (EVD) CDNA National Guidelines for Public Health Units.

Available at http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-ebola.htm/$File/EVD-SoNG.pdf

For more information

Communicable Disease Control Branch (CDCB)
Telephone: 1300 232 272
www.sahealth.sa.gov.au/ebola

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Appendix D: Overview of Viral Haemorrhagic Fevers

Incubation periods

Note: that the incubation periods for these diseases are:

- Lassa 6 - 21 days
- Ebola 6 - 21 days
- Marburg 3 - 10 days
- Crimean-Congo 1 - 12 days (usually 1 - 3 days)
- Clinical features for suspected cases of VHF

Ebola and Marburg virus disease: Characterised by the sudden onset of fever, malaise, myalgia, and headache, followed by pharyngitis, vomiting, diarrhoea, and a maculopapular rash. Haemorrhagic manifestations are seen in less than half of cases. Haemorrhage and shock are more likely in the second week.

Lassa fever: Characterised by the gradual onset of fever, malaise, myalgia, headache, vomiting and diarrhoea. Pharyngitis and conjunctivitis are prominent. Only 20 percent have severe symptoms, which may include pleural effusions, haemorrhage, seizures, encephalopathy and oedema of the face and neck.

Crimean-Congo haemorrhagic fever: Characterised by the sudden onset of fever with headache, myalgia, arthralgia, abdominal pain, and vomiting. Conjunctivitis, pharyngitis and palatal petechiae are also common. Bruising and widespread haemorrhage typically starts after four days.

Quick Reference Guide for Viral Haemorrhagic Fevers

VHF	DISTRIBUTION	RESERVOIR	INCUBATION PERIOD	CLINICAL PRESENTATION	DIAGNOSIS	FATALITY RATE	TREATMENT	INFECTIOUS MATERIAL
Lassa	Sierra Leone, Nigeria, Liberia, Guinea, Senegal, Mali, Central African Republic	A small wild rodent, Mastomys natalensis.	6-21 days	Fever, muscle and joint aches, diarrhoea, vomiting, sore throat progressing to swelling of face and neck, general oedema, bleeding, encephalopathy, shock, residual deafness in 25%.	Blood, urine, throat swab for culture. Blood for NAT. Conjunctival scrape for antigen. Serum for IgM & IgG	15%	Ribavirin effective for treatment and prophylaxis.	Blood and body fluids in acute illness. Urine for 3 weeks, semen for 3 months
Ebola virus disease	Sudan, Democratic Republic of Congo, Ivory Coast, Gabon, Uganda, Guinea, Liberia, Sierra Leone, Philippines	Unknown – bats suspected. Humans usually first infected from non-human primates.	2-21 days	Fever, muscle and joint aches, diarrhoea, vomiting, sore throat progressing to swelling of face and neck, general oedema, bleeding, encephalopathy, shock, residual deafness in 25%.	Blood for NAT. Blood, urine, throat swab for culture (must be sent to NHSRL).	50-90%	None proven.	Blood and body fluids in acute illness. Excreted in semen for up to 10 weeks after clinical recovery.
Marburg	Zimbabwe, Kenya, South Africa, Uganda, Tanzania, Congo.	As for Ebola.	3-10 days	Similar to Ebola. May be prolonged recovery with orchitis, hepatitis, uveitis, transverse myelitis.	Blood, urine, throat swab for culture. Blood for NAT. Conjunctival scrape for antigen. Serum for IgM & IgG.	20-30%	None proven.	Presumed same as Ebola
Crimen Congo Haemorrhagic Fever	Eastern Europe, Middle East, Mediterranean, Central Asia, India, most of Africa	Small mammals. Humans usually acquire via ticks.	1-12 days	Non-specific ➔ headache, gastrointestinal disturbances, conjunctivitis, jaundice, neurological haemorrhage	Blood, urine, throat swab for culture. Serum for IgM & IgG. Conjunctival scrape for antigen.	2-50%	None proven. Possibly ribavirin or immune plasma	Blood and body fluids. Highly infectious in hospital settings.

Appendix E: Contact numbers

Communicable Disease Control Branch (including Chief Quarantine Officer)

- Ask to speak with a medical officer — 1300 232 272 (24 hours / 7 days)

Royal Adelaide Hospital

- Switchboard — 08 7074 0000
- Ask for the ID physician on-call

Women's and Children's Hospital

- Switchboard — 08 8161 7000
- Ask for the ID physician on-call

SA Pathology

- Switchboard — 08 8222 3000
- On call microbiologist — 08 8222 3123

South Australian Ambulance Service

- Emergency — 000
- Duty manager — 1300 886 268

Biosecurity Service (Airports, SA) – Australian Department of Agriculture

- Switchboard — 08 8201 6000
- Quarantine 24/7 contact — 8201 6213

Adelaide Airport

- Terminal operations manager — 08 8154 9465

SA Port Authorities

- Operated by Flinders Ports — 08 8447 0611

Australian Government Department of Health

- National Incident Room (Canberra) — (02) 6289 3030

Appendix F: SA Health EVD waste treatment and disposal protocol

Waste

Items stained or containing body fluids or suspected to be contaminated must be treated as category A clinical waste.

Category A clinical waste will be managed by double bagging and being placed into a rigid container for transport as Category A clinical waste for incineration.

Double Bagging

Facilities should have a system of double bagging the clinical waste. This should involve keeping the first clinical waste bags inside the patient room and then placing these bags inside a second clinical waste bag kept outside the patient room.

Clinical waste bags must adhere to relevant Australian Standards, be of a thickness of at least 50 microns and be leak proof. The inner and outer bag should contain super absorbent powder to containing any residual liquids and be sealed prior to transfer for inactivation on site or placement into a rigid outer container for transport.

Bags should not be filled to capacity as this will prevent them from being adequately sealed.

Where sharps containers are used, these must be certified to AS4031:1992 and be placed in an outer bag containing super absorbent material.

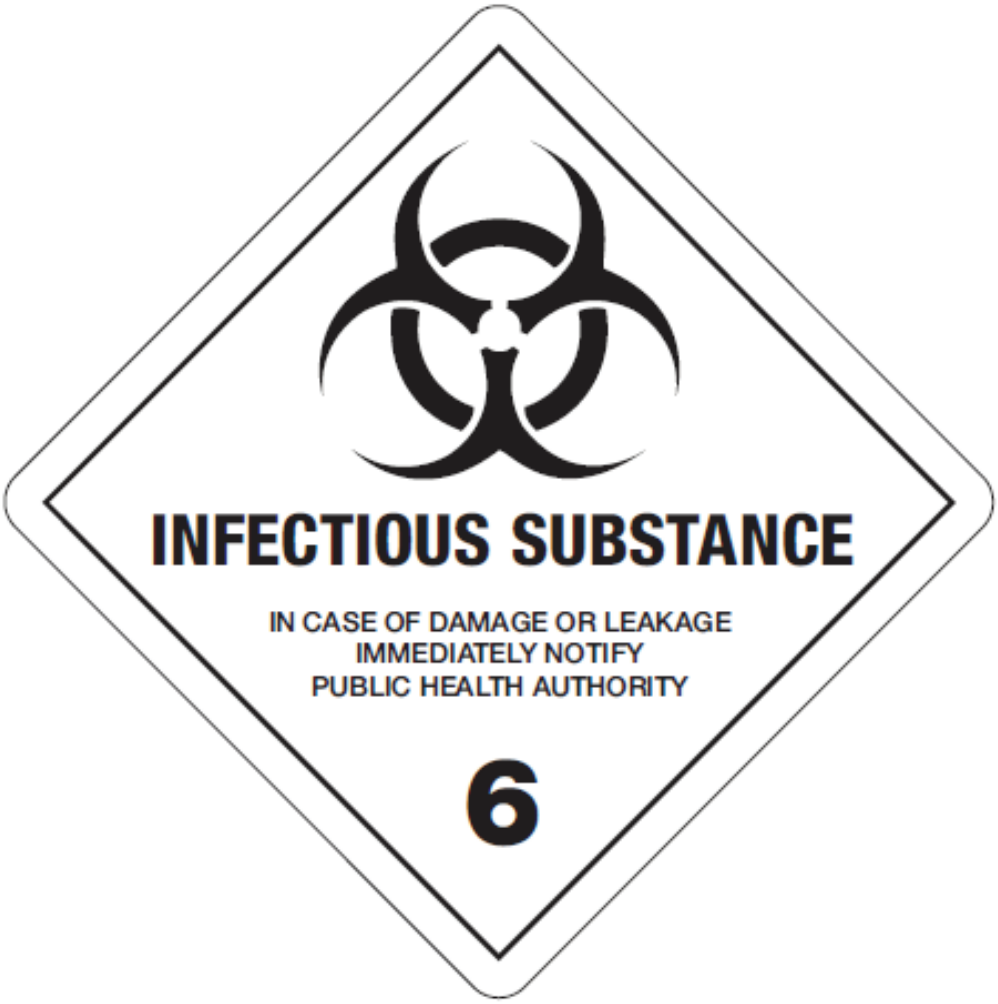
Filled double bagged wastes are to be placed into a dedicated clinical waste bin that carries labelling consistent with UN2814/ADG Class 6.2 for transport.

Preparation for Transport

Double bagged wastes for transport and destruction via incineration must be placed and secured in a dedicated rigid container that is leak proof, puncture resistant and able to be secured (e.g. 240L mobile clinical waste bin). The rigid container must carry labelling consistent with Australian Dangerous Goods Code 6.2/UN 2814 –

DANGEROUS GOODS CLASS 6.2

INFECTIOUS SUBSTANCES AFFECTING HUMANS UN2814



Waste to be temporarily stored prior to transport must be secured in a dedicated area where unauthorised access is prevented to avoid tampering or accidental spillage.

The transfer of Ebola waste into the custody of an appropriately trained and licensed waste management company should be documented.

Toilet Waste

Toilet waste can be flushed into the sewage system.

Some jurisdictions may recommend additional measures be applied after discussion with local water authorities. Additional measures may include the addition chlorine (in a suitable concentration for a spill) to the toilet waste prior to flushing, and allowing up to 30 minutes, prior to flushing.

In all cases, ensure the toilet lid is down when flushing. If staff are required to flush the toilet, it is recommended they wear a P2/N95 mask in addition to their other PPE in case of aerosols when the toilet is flushed.

If a patient is unable to use the private bathroom, a disposable pan should be used. The contents of the pan are to be solidified with high-absorbency gel then both the pan and contents disposed into clinical waste.

Appendix G: Management of BBFE flow chart

EBOLA*: Management of blood and body fluid exposures (BBFE)

LOWER RISK EXPOSURE

1. Self-contamination during personal protective equipment (PPE) removal

2. Breaches in PPE (malfunction or tear)
   > Withdraw from patient care area

> Observer (in PPE) to inspect for contamination
> Remove PPE carefully according to doffing procedure

FIRST AID, if required

Worker to shower then change into fresh scrubs

Manager to inform:
Infectious Diseases, Worker Health, Safety Learning System (SLS)
Consider referral to Employee Assistance Program (EAP) &/or Communicable Disease Control Branch (CDCB)

Worker Health / Infection Control to provide:
> thermometer
> information for worker and family

Worker to: Self-monitor temperature for 21 days
If fever or any other symptoms of Ebola develop, isolate self and contact CDCB
NB: A healthcare worker with any symptoms of Ebola must not work. A symptom free worker can work.

FIRST AID

Eyes: Flush with water or saline for at least 30 seconds. If contact lenses worn, remove lenses and flush again – Dispose of lenses in clinical waste. Do not reinsert.

Mouth: Spit out. Rinse mouth with water and spit out, repeat twice

Skin: Wash area thoroughly with soap and water**

HIGHER RISK EXPOSURE

3. Needlestick or sharps injury

4. Direct splash:
   a) Intact skin
   b) Mucous membranes / non-intact skin**

> Withdraw from patient care area
> Observer (in PPE) to inspect for contamination
> Remove PPE carefully according to doffing procedure

FIRST AID

Worker to shower then change into fresh scrubs

Manager to inform:
Infectious Diseases, Worker Health, SLS

Worker to phone CDCB 1300 232 272 for exposure assessment and to follow routine LHN/HS BBFE procedure, plus additional risk based testing indicated by Infectious Diseases

Worker Health / Infection Control to provide:
> Blood testing
> referral to EAP
> thermometer
> information for worker and family

Worker to undertake twice daily temperature monitoring for 21 days
CDCB will follow up daily with the worker
If fever or any other symptoms of Ebola develop, isolate self and contact CDCB
NB: A healthcare worker deemed to have a high risk exposure should not work for 21 days from date of exposure

* Official title Ebola virus disease, previously known as Ebola haemorrhagic fever. Also applicable for other Non Vector Borne Viral Haemorrhagic Fevers:
> Crimean Congo Haemorrhagic Fever
> Lassa Fever
> Marburg virus
> OMSK Haemorrhagic Fever

** People with non-intact skin (e.g. dermatitis) that cannot be covered with a water proof dressing should not be caring for patients with Ebola.

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Appendix H: EVD PPE Donning & Doffing Procedures

SA Health

Ebola Virus Disease (EVD) Personal Protective Equipment (PPE) donning and doffing procedure

Scope

This document provides guidance for level 2 PPE to be used by healthcare workers (HCW) in non-quarantine hospitals who may provide care for patients requiring short term management prior to transport to a quarantine hospital.

Although primarily aimed at clinicians, other hospital staff such as cleaners or security, or visitors, will be required to use this procedure if entering the room of an EVD patient.

Key principles

The following key principles must be followed when using personal protective equipment (PPE).

Donning (putting on) PPE:

> Have a consistent sequence.
> Ensure PPE selected is an appropriate size so movement is not restricted.
> PPE must be fitted correctly (especially respirators, if used).
> Take your time to put on your PPE.

Wearing PPE:

> **Do not** adjust your face protection (face shield, mask) whilst in the patient's room.

Doffing (taking off) PPE:

> PPE should be visually checked for damage or tears.
> Have a consistent sequence.
> Minimise contact with contaminated surfaces of the PPE.
> Take your time to remove PPE to avoid contamination of scrub suit and/or skin.
> Perform hand hygiene prior to removing any PPE from your face.
> Follow the "Ebola: Management of blood and body fluid exposures" protocol if self-contamination occurs during PPE removal, if a breach in PPE (malfunction or tear) occurs or higher risk exposure (e.g. needlestick) occurs.

Role of the observer ("buddy")

The level of PPE required by the observer will depend on whether they will assist in patient care. For example:

> If there is only 1 HCW in the patient's room then full PPE should be worn by the observer to be ready to assist at any time.
> If there are 2 HCWs in the patient's room then hoods and leg covers are not required by the observer (refer to observer donning and doffing section).

The observer will be responsible for:

> Assisting the HCW with donning PPE prior to entering the patient's room:
  - Ensure the HCW puts on appropriate PPE in the correct order according to the checklist. Each item should be checked off on the list.
  - Assist where required e.g. fastening the gown at the back.
  - Perform a final check of all PPE prior to the HCW entering the patient's room to ensure all skin and clothing is covered. This includes bending, stretching, etc., to ensure PPE remains in place during normal activity. If there are any concerns, do not allow the HCW to enter the patient's room.

- Observe HCW at all times whilst in the patient's room for any breaches in PPE e.g. HCW touches face or dislodges PPE.
- Assist the HCW with doffing PPE after leaving the patient's room:
  - Check all PPE worn by the HCW for damages or tears
  - Ensure the HCW removes PPE in a safe manner by calling out instructions according to the checklist below. Each item should be checked off on the list.
  - Assist HCW with untying the gown, if required.
  - Assist HCW with the removal of leg covers, if required.
  - Clean the doffing chair with detergent/disinfectant wipe(s) after use.
- Assist with waste disposal from the patient's room:
  - Depending on the local protocol and layout of the dedicated area, the observer may assist with the removal of waste from the patient's room. This may include taking the clinical waste bag from the patient's room and placing into the designated 240 litre yellow clinical waste bin in the doffing zone.

Required facilities and equipment

Two separate donning and doffing zones are recommended (i.e. clearly identified "clean" and "dirty" zones) to reduce the risk of any contamination of the donning zone.

Donning zone

The donning zone should include:

- alcohol-based hand rub (ABHR)
- mirror
- 1 chair or stool
- bowl/container/bag to collect all personal items e.g. phone, jewellery, pens, pager etc.
- scrubs (top and bottom) – depending on the layout these may be available in a separate changing/locker room
- trolley stocked with PPE and other essential items.

HCW PPE:

- Impervious long-sleeved gown (large enough to cover across the back and below the knees to mid-calf).
- Apron
- Full face shield which is impervious to fluids.
- Correctly fitted P2/N95 respirator.
- Impervious hood (covers the head and neck, outlines the face, extends to shoulders)
- Disposable gloves of all sizes. These should include a longer length, non-sterile or sterile gloves to ensure the glove covers the cuff of the gown.
- Fluid resistant, non-slip leg coverings which cover the lower leg area and shoes.

Observer PPE:

- Impervious long-sleeved gown.
- Face shield which is impervious to fluids and a fluid resistant surgical mask OR a combined fluid resistant surgical mask with attached visor.
- Disposable gloves of all sizes. These should include longer length non-sterile or sterile gloves to ensure the glove covers the cuff of the gown.

Doffing zone

The doffing zone should include:

> Alcohol-based hand rub.
> Detergent/disinfectant wipes.
> 1 chair or stool.
> Cover for chair or detergent/disinfectant wipes.
  - Yellow 240 litre clinical waste bin. The lid can be left open during doffing as it poses no infection risk. However, the lid should be closed and the bin wiped over with detergent and disinfectant (detergent/disinfectant wipes can be used) prior to removal from the area.
> Optional: doffing mat (e.g. a large Kimguard™).

Desired outcome

The photographs below illustrate the completed donning of full PPE – front and back view:

Checklist – HCW

Donning

For a suspected, probable or confirmed case, put on PPE using the following precise order.

Ensure the HCW is well hydrated and has been to the toilet prior to commencing procedure.

Step	Description	Check
1. Remove personal clothing and items. Put on scrub suit. Secure prescription glasses, if worn, with tape. Tie hair back off face	Put personal items into bowl/container/bag. These include all jewellery (including wedding band), watch, mobile phone, pager, pens, ID tag, etc. No personal items should be taken into the room.	
2. Inspect PPE prior to donning	Observer reviews the donning procedure with the HCW. Visually inspect the PPE for damage or tears. Do not use damaged or torn PPE. Ensure correct size PPE is selected.	
3. Put on leg/shoe covers	Sit on stool and apply leg covers. Ensure the non-slip surface faces the floor. If straps are available, tie firmly around the leg. Ensure straps are comfortable and are not a trip hazard.	
4. Perform hand hygiene	Use ABHR and allow to dry.	
5. Put on inner gloves	Use long cuffed or sterile gloves. If possible, use different coloured gloves to assist with visualising breaches.	
6. Put on impervious long sleeved gown	Gown should be of sufficient length to sit mid-calf. Back should be covered by wrapping the gown around the waist and tying at the side. Observer may assist with donning.	
7. Put on P2/N95 respirator	Select the correctly fitted P2/N95 respirator. Ensure a "fit check" is performed. Adjust if necessary.	
8. Put on hood	Ensure the hood covers all of the hair and ears and extends past the neck and shoulders. Aim for the respirator to go through the face hole when applying hood. Use the mirror to check. Go through a range of motions to ensure there is sufficient range of movement whilst all areas of the body remain covered.	
9. Put on outer apron (if needed)	Put on an impervious apron, large enough to cover the front of the body and legs. **Note:** *Outer apron needs to be used when large amounts of body fluids are present.*	
10. Put on outer gloves	Put on second pair of gloves with extended cuff. Ensure the cuffs are pulled over the sleeve of the gown. Sterile gloves can be used for better fit.	
11. Put on face shield	The length of the face shield should be long enough to adequately cover well below the chin.	
12. STOP and CHECK	After completing the process the integrity of the PPE is verified by the observer. The HCW should be comfortable and go through a range of motions to ensure there is sufficient range of movement whilst all areas of the body remain covered. The HCW should use the mirror as a final check prior to entering the patient's room. **Note:** *If the PPE does not pass this check then DO NOT enter the patient's room. Adjust PPE then recheck.*	

Doffing

Take off PPE using the following precise order.

Note: under normal circumstances disinfection of gloved hands is not recommended. Disinfection of gloved hands should be considered a practice applicable only to care for a patient with suspected, probable or confirmed EVD.

Ensure area is prepared e.g. chair, doffing mat, ABHR, detergent/disinfectant wipes, clinical waste bin are available.

Step	Description	Check
1. Wipe gloves using a detergent/disinfectant wipe	Discard the wipe into the clinical waste bin in the patient's room. **Note:** *This step is only required if removing an outer apron*	
2. Remove outer apron (if used) in patient's room	Remove apron (tear from the top) by rolling the apron from inside to outside. Discard apron into the clinical waste bin in the patient's room. Take care to avoid contaminating gloves.	
3. Wipe gloves using a detergent/disinfectant wipe, discard wipe, then exit patient's room	Discard the wipe into the clinical waste bin in the patient's room. Exit patient's room into the doffing area.	
4. Step into doffing zone	The area should be large enough so there is plenty of room to move.	
5. Inspect your PPE	Observer to assist and record any breaches in PPE.	
6. Remove outer gloves	Slip finger underneath outer glove and carefully remove without touching outside of glove. Discard into designated clinical waste bin in doffing zone.	
7. Inspect and disinfect inner gloves	Observer to record any breaches in PPE.	
8. Remove hood and face shield	Grasp the back of the hood and the straps of the face shield from the MIDDLE of the head and bend forward. Slowly remove both items and discard into clinical waste bin in doffing zone.	
9. Disinfect inner gloves	Use ABHR and allow to dry. Observer dispenses the ABHR or use an automated dispenser.	
10. Remove gown carefully	Untie gown straps. Observer can assist with this. Remove gown by placing hands on the inside of the gown, carefully folding the gown into a bundle with the inside facing out. Discard into clinical waste bin in doffing zone.	
11. Disinfect inner gloves	Observer to record any breaches in PPE.	
12. Remove leg/shoe covers. Observer can assist with this process	> sit on DOFFING CHAIR > roll the top of the leg covers down for 2 turns (both legs) > carefully untie straps and remove the leg covers by grasping the heel area and pulling away from body > discard leg covers into clinical waste bin in doffing zone > place feet directly onto the floor away from the doffing mat/zone. Hint: it is easier to remove the leg/shoe cover closest to the non-doffing zone first. **Note:** if the observer has assisted to remove the leg covers, then the observer's gloves must be changed. HCW must wait for observer to finish this process.	

Step	Description	Check
13. Disinfect inner gloves	Use ABHR and allow to dry. Observer dispenses the ABHR or use an automated dispenser.	
14. Remove inner gloves	Slip finger underneath inner glove and carefully remove without touching hands. Discard into the clinical waste bin in doffing zone.	
15. Perform hand hygiene	Use ABHR and allow to dry.	
16. Remove P2/N95 respirator	Grasp respirator straps from the back of the head, bend forward so the mask slips off the head away from face and discard into clinical waste bin in doffing zone.	
17. Perform hand hygiene	Perform a soap and water hand wash.	
18. HCW can leave the doffing zone wearing shoes and scrubs. *Remember to rehydrate if feeling hot*		
19. Follow the "Ebola: Management of blood and body fluid exposures" protocol if self-contamination occurs during PPE removal, if breaches in PPE (malfunction or tear) occurs or higher risk exposure (e.g. needlestick) occurs		
20. Shower at the end of every shift if high risk patient care procedures have been performed, if the HCW has spent extended periods of time in the patient's room, or if a breach in PPE occurs		

Checklist – observer

Donning

Put on PPE using the following precise order.

Step	Description	Check
1. Perform hand hygiene	Remove jewellery and wrist watches prior to commencing procedure	
2. Put on gown	Long-sleeved, impermeable gown.	
3. Apply face protection	A fluid-repellent surgical mask with attached visor is recommended	
4. Put on 2 pairs of gloves	> Put on first pair and tuck under the cuffs of the gown > Put on second pair of gloves with longer cuff. Ensure the cuffs are pulled over the sleeve of the gown. Sterile gloves can be used for better fit.	
5. STOP and CHECK	Adjust if does not pass check. Then recheck.	

Doffing

Take off PPE using the following precise order.

Step	Description	Check
1. Wipe chair (top, seat and then legs) in doffing zone and/or remove cover	Use detergent/disinfectant wipe. Discard wipe into clinical waste bin in doffing zone.	
2. Clean up doffing zone	Pick up corners of used doffing zone mat (if used) and gather corner to corner. Discard into the clinical waste bin in doffing zone.	
3. Disinfect outer gloves with ABHR (or wipe with detergent/disinfectant wipe if visibly soiled) then remove outer gloves	Use ABHR and allow to dry (or wipe gloves if visibly soiled). Remove outer gloves; slip finger underneath outer glove and carefully remove without touching inner glove. Discard into clinical waste bin in doffing zone.	
4. Remove gown	Remove by placing hands on the inside of the gown, carefully fold the gown into a bundle with the inside facing out. Discard into the clinical waste bin in doffing zone.	
5. Remove inner gloves	Slip finger underneath inner glove and carefully remove without touching hand. Discard into the clinical waste bin in doffing zone.	
6. Perform hand hygiene	Use ABHR and allow to dry.	
7. Remove face protection	Carefully untie the straps, bend forward and remove slowly in a downward direction and away from the face. Discard into the clinical waste bin in doffing zone.	
8. Perform hand hygiene	Perform a soap and water hand wash.	

For more information

Communicable Disease Control Branch (CDCB)
Telephone: 1300 232 272
www.sahealth.sa.gov.au/ebola

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Appendix I: Abbreviations

AHPPC:	Australian Health Protection Principal Committee
CCHF:	Crimean-Congo haemorrhagic fever
CDC:	Centers for Disease Control and Prevention
CDCB:	Communicable Disease Control Branch
CQO:	Chief Quarantine Officer
DHQ:	Australian Department of Health Director of Human Quarantine
EMU:	Emergency Management Unit
EVD:	Ebola virus disease
ID:	Infectious Disease
IMT:	Incident management team
LHN	Local Health Network
NAT:	Nucleic acid testing
NHSRL:	National High Security Reference Laboratory
NIV:	National Institute of Virology
PHEIC:	Public Health Event of International Concern
PPE:	Personal Protective Equipment
RAH:	Royal Adelaide Hospital
VHF:	Viral Haemorrhagic Fever
VIDRL:	Victorian Infectious Diseases Reference Laboratory
WCH:	Women's and Children's Hospital

For more information

Communicable Disease Control Branch (CDCB)
1300 232 272
www.sahealth.sa.gov.au/ebola

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